

COAL AGE

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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. Dawson Hall
Engineering Editor

Volume 26

NEW YORK, DECEMBER 18, 1924

Number 25

Watching Our Opportunities

IN ENGLAND the coal market apparently is getting a bit restive because the conservative party was able to resume the reins of government. "Sooner or later," says a letter from a large English jobbing house to a list of American coal producers, "the new conservative government is going to get into trouble with our miners." If that time comes English coal production may be expected to be shut off again with consequent effect upon the importation of coal by England. This prospect adds another reason for the firm retention abroad of the trade representatives of the Department of Commerce. When there is any foreign economic disturbance either in prospect or in process this country needs to have a keen eye and ear on the spot.

Pooling Brains and Experience

COAL COMPANIES, especially those in the anthracite region, do not arrange that their engineers and other workmen have sufficient opportunity to associate together and learn one from the other. One coal company official claims that the managers get together and interchange views on their various problems and go back to their offices and carry out their plans.

If this is all they do, it is easy to see why one company is highly developed along some lines of electrical application and a laggard along many others. When engineers themselves do not know what the other fellow is doing and cannot see where they themselves are progressive or unprogressive, how can they grasp the second-hand or third-hand information which may be transferred to them through official channels?

The electrical engineer has too hard a task today making his own president or general manager understand the problems pertinent to his own organization to hope to acquire information from another company by indirect methods.

A good live society is needed, and the coal companies themselves should encourage its formation.

Fumbling at the Knot

COLLEGES and universities still fumble at the knot. If they want to train practical men, they must get men of practice in their college faculties. They must select electrical engineers who have worked at the bench, on the road, in the mine. They must get mining engineers who have designed and erected tipples as mining-company employees or as manufacturers' representatives. They must get as mechanical engineers men who can design and construct hoists, who can go into the factory or the boiler shop and take charge.

That requires money. That involves a reconstruction of staffs. Colleges are today too frequently merely bricks, marble, and stark intellect. Our industrial colleges should be built on the right kind of brains, on men who have an industrial knack, rather than an

intellectual afflatus. Too often college heads have gone the rounds looking for men at knockdown prices. They choose clever young men for fellowships it is true, who are good experimenters perhaps, but are failures as executives, designers and operating officials. Some day we may learn that the kind of talent that colleges must seek is talent that will sell, that commands a high price in the market.

The colleges must enter into competition with industry on equal terms, and when a college sees a man in the forefront of industrial progress it must offer him a salary that will lure him to the classroom. There is no other way of cutting the knot with which so many colleges are still fumbling. They get what they pay for, and the colleges do not grow. They become centers of research and of elementary education but not training schools for the higher walks of industry. Today young men must go into an apprenticeship in the shops and in the mines where they can be placed under talent of a kind which the colleges cannot attract because they are unwilling to pay for it. Let us hope that the collegiate atmosphere will come closer year by year to that of the mines, the mills and the factory and that of the millions given to educational institutions more will be spent in the endowment of adequate faculties. The glory of a college is not in its buildings but in its staff and in its students. Let that never be forgotten.

What Makes for Stabilization?

STRANGE is the reasoning of those who would stabilize the coal industry. They tell us there are too many bituminous miners, and so there are; altogether too many. Those who question that statement are men who for their own personal advantage want to increase or at least maintain production. But there is too great a mining capacity already; so their contention is at fault.

What the stabilizers overlook is that the present wage is too high. If it were lower the excess of mine workers would automatically correct itself as it does in other industries. So long as wages are sustained by the same persons who desire to reduce the number of mine workers there cannot be any correction of the present situation. Where men can get \$7 to \$15 a day it is not likely that they will leave the industry permanently. Slow runs and short time may temporarily deplete an industry with such a wage rate—whether it will, is questionable—but it will not permanently reduce the number of men engaged in it. They will come back as soon as there is a demand for their services and even before they can be assured steady work. Lower wages will cure the excess and indeed little else will do it, except a restriction of the entrance of new blood into the industry by requiring previous experience in the mines. This latter course makes work in the mines a monopoly, and that surely is undesirable.

In most other industries, with the notable exception

of railroading, the wage is determined by supply and demand. Consequently when the demand is low, the supply falls off. In the coal industry when times have been bad and work has been irregular, the wage is raised by a fiat of the Administration and of the public. Thus the miner is compensated for his past idle time, and the wage is pushed further up above the normal rate; this is crystallized by an agreement. More men enter the industry. Business declines, and the miner soon suffers from short time.

When times improve he asks for more wages to compensate for the short working hours of a previous year. Again he gets an increase, and again more men enter the industry. It is a vicious circle. We get nowhere by adopting the plan of giving a yearly wage to the miner. We make it necessary to pay ever more and more. It makes more idleness, more discontent. The wage that is given makes a higher wage more necessary. The path we are treading leads ever to a more aggravated condition of a deplorable evil.

More men means large mine capacity and more mines; so that the other evil, too many mines, follows in the same train. Figure the miner's wage per day and not per year, and conditions will right themselves. An uneconomic theory is bearing the industry fast to the rocks of over-manning and overdevelopment, and the stabilizers should realize that fact. But politics makes it necessary to talk stabilization and high wages in the same breath, and who will say that the one does not negative the other? The stabilizers do not know whether they are singing bass or soprano.

Line Up with the Best

WHAT a confusing babel of sounds one can expect to hear when the United Mine Workers' officials get together to plan legislation to curtail the use of electricity in the mines, as they have declared it their purpose to do at their recent meeting in Harrisburg.

In the anthracite region many companies do not know what the others are doing, electrically. One large company may pride itself upon its power plants and extensive use of electricity, yet be far behind another and a smaller company that has put more brains into its work. Each company has relied too much on its own ability to think out and devise new plans, and as a result is in some ways far behind others in the safe use of electricity.

The electrical hazards found at some mines are real and many. There are breakers which have no electric lights but instead use open-flame oil lamps with their ever-present fire hazard. Well-lighted shaft bottoms greet you in some mines whereas others are dark and damp death traps. At some mines only 440-volt motors are used, but they are installed in such a manner that they are more dangerous than the 2,300-volt motors at another mine.

Crooked and twisted trolley wire supported on old-type hangers which leak and cause the trolley wire to sputter sparks on powder cans, hay and feed have taught some companies serious lessons. Open-type circuit breakers instead of closed types have caused dangerous flashes. Sectionalizing trolley switches left closed during the night have been responsible for mine fires. Leakage currents in hoisting cables and pipes have shocked the workmen.

In every anthracite mine some of these hazards have been guarded against, but others have made no provision against them. Despite the need for concerted

effort the coal companies have never met to formulate definite practices that would assure safety.

Perhaps the greatest difficulty of all lies in the fact that the mine foreman and not the electrical engineer supervises the work of the men in the mines who maintain, operate and repair the electrical equipment.

Your Place in the Coal Industry

ACERTAIN large operator had several mines in an excellent coal seam and under that almost unequalled bed lay two or three more beds of coal, above the average, it is true, but not equal to the first. Did he mine these latter? Not at all. He mined out the best coal and looked around for more.

He thought that he had found a good deposit and opened a mine in it, spending a million dollars before he got a single pound of coal. It will be remembered that in those earlier days a cool million was regarded as a tremendous sum. He found, however, that the coal he got from his new venture was fast injuring his reputation. It was altogether too volatile and had too much ash. He could have continued to sell it for what it was, a coal of medium quality, but he could not prevent it from lowering his standing in the market. Even had he organized another company to work the coal and sell it, there always would have been the assurance that the story would leak out that he was the principal owner, and the sale of it would injure the excellent reputation he had acquired of marketing nothing but the best, so he sold the mine to other operators who could well afford to ship such coal, seeing that they were already producers of coal of only medium quality and traded in a less discriminating market.

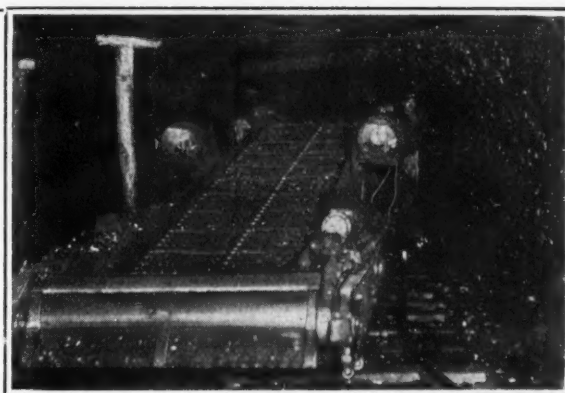
About the same time he purchased another field having a seam of excellent coal. Above the bed he bought was another containing a coal of equally low volatile content, but it had more sulphur. He did not buy that bed, however. He was determined to mine nothing but the best.

In time the coal seam in the area in which he first operated was exhausted, and he leased out the other seams below it. These seams had fairly good coal, as has been stated, but he would not work them. They would have injured his reputation. He concentrated his efforts on the good seam in the new area he had purchased and developed. Now he is making an analysis survey of this good seam so that he can mine the best of it, and leave the rest.

The time may come when he will have to work what he is rejecting. Some time he may have to mine this less desirable coal or perhaps may have to establish himself where the coal is still lower in heating value. But he will maintain his standing by mining the best that is obtainable. To do otherwise will mean that he will be obliged to class himself with those who are producers of only fairly good coal. He may wash it and table it, but it is likely that it will never be as good as that which he is now selling. However, he will see to it that it is still the best on the market.

The moral is short and pithy. Do not go to the market with all kinds of coal for all comers. Specialize on one kind of coal with preference for the best. Some of the present consolidations may not have been formed with this simple rule in mind. If a man is known to have a good and an only medium coal, his customers will be wary of buying from him, for they will hear on one side of his higher price and on the other side that his coal is not of first quality. Standardize, therefore, standardize!

Machine Loads 377 Tons Into 2-Ton Cars In 8 Hours From Room Workings



Traversing a Crosscut

Average Production of Machine for a Month, 289 Tons—Crosscut Turnouts and Two Car-Shifting Locomotives Facilitate Loading—Big Car Advantageous—Pillar Coal Is Being Loaded Mechanically

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THAT LOADING machines can be applied successfully to room-and-pillar mining is being convincingly demonstrated at a mine in northern West Virginia where substantial increases in the daily output per man employed and important savings in the cost of production have been made. Even so, what is being accomplished is only of an experimental nature intended to serve as a guide in the planning of future mechanized developments.

Impressed with the possibilities of saving in the labor of coal loading by the use of machines, the Pittsburgh & Erie Coal Co. procured an Oldroyd loading machine for use in its Sumner No. 2 operation. This mine is located at Braznell in the Monongahela district of Pennsylvania. What the company desired to ascertain was the exact degree to which the theoretical possibilities of loading machines could be realized.

This loader was put to work in the thick Pittsburgh bed under conditions that could not by any means be considered favorable. Sumner No. 2 is an old and almost exhausted operation. No block of coal of adequate size for experiments in mechanical loading could be found in it, and for this reason, tests of the machine's loading ability were somewhat desultory and inconclusive. It was soon discovered, however, that even in the Pittsburgh bed, with its troublesome draw-slate, loading machines possess more than mythical advantages. Upon one occasion the machine succeeded, during an 8-hr. shift, in loading 250 tons of coal into mine cars of 1.6 tons capacity.

NEW AND MORE PROMISING FIELD PROVIDED

Desiring to continue the experiments where they were discontinued, but under conditions similar to those prevailing at the Sumner No. 2 operation, the Pittsburgh & Erie Coal Co. closed negotiations for the privilege of mechanically loading coal in a small section of the Robert mine near Clarksburg, W. Va., this mine being owned by the New Superior Coal & Coke Co. Incidentally it may be said that during the recent war an attempt was made to produce coal in this property

Although the loading machine shown in the headpiece is 45 ft. long it is built in three sections or segments and as may be judged from the illustration no difficulty is experienced in taking it through crosscuts. These passages, however, are driven on a 45-deg. angle and the track curves have 35-ft. radii.

by stripping. This, however, failed because the cover, which ranged from 40 to 75 ft., was too thick for ordinary stripping equipment.

Machine loading in the Robert mine under the supervision of T. F. Whalen, general superintendent of the Pittsburgh & Erie Coal Co., began about the middle of July of the present year. Some time was required, however, to prepare the sections and make the changes necessary for the introduction of machine methods, and it was not until the latter part of August that the work approached the production stage.

During twenty-four 8-hr. shifts worked in September, one machine loaded 6,058 tons, or an average of 252 tons per day. Twenty-four men including a mine foreman, mined, shot, loaded and transported all this coal from the face to the railroad car. The daily output per man employed was thus $10\frac{1}{2}$ tons. The results achieved during 17 working days of October, however, were far better. During this month the same number of men with one loading machine produced an average of 289 tons per shift, or a daily output per man of 12 tons. Even this performance is scarcely indicative of the machine's possibilities, for on one day the crew mechanically loaded 377 tons of coal.

The Oldroyd machine used at this plant is 42 ft. long and weighs 22 tons. Although its over-all height is 54 in., it can operate in a 5-ft. coal bed. It travels upon, and works from, the mine track, its massiveness of construction enabling it to push itself under loosened coal and thus to break out hanging shots. The machine is not only powerful, but it has also a reach that enables it to gather in the coal from the entire face without leaving the track. It is equipped with three conveyors, the middle one being fixed to the body, while the front and rear sections swing in either direction, horizontally as well as vertically. Both motions can be made simultaneously.

TWO CUTTER CHAINS DRIVE LOADING HEAD

Coal is fed into the forward conveyor by means of a revolving dipper. This consists of a roll of small diameter on which are cast two plate paddles spaced 180 deg. apart. This feeding device is driven by two cutter chains provided with pick bits which cut a path in the coal pile for the bearings as the machine

advances. The main body of the loader is supported by two sets of swivel trucks which enable it to round curves with ease.

Five motors are utilized to give independent yet correlated movement to the various machine elements. As far as possible, chain drives have been eliminated, transmission being made by means of gears and worms.

Two men operate the machine. One controls its forward movement, the starting and stopping of the dipper and the swinging of the forward boom. The other starts and stops all three conveyors and controls the position of the rear boom. This two-man control is analogous to that of the ordinary steam shovel.

The layout of the Robert mine where this machine is employed is shown in Fig. 4. Rooms are driven 400 ft. long and 20 ft. wide on 30-ft. centers. They are necked on a 45-deg. angle in order to provide a turnout of greater radius than is normally provided for gathering locomotives. This is necessary to facilitate movement of the loading machine. For the same reason crosscuts are turned on a 45-deg. angle in one direction only. The inby crosscut, placed at a convenient distance from the room faces, is tracked to



Fig. 1—Loading Machine Used in Robert Mine

In this illustration the loader is in working position at the end of a coal pile. Inasmuch as this machine operates from a track the span of unsupported roof is only slightly greater than the depth of cut plus the track gage.

expedite haulage and to permit of the movement of the loading machine from one room to another without the necessity of traversing the butt entry. As a matter of fact, only one of the crosscut turnouts is of sufficient radius to enable the loading machine to pass between the rooms thus connected. It is the intention to install turnouts of 30- to 35-ft. radius equipped with a No. 2 frog.

The track is laid up the center of the rooms. On each side of this room track is set a row of props on 5-ft. centers. The coal is cut to a depth of $8\frac{1}{2}$ ft. at a height of $6\frac{1}{2}$ ft. above the floor, leaving 1 ft. of top coal to protect the roof. Fig. 6 shows a circular cut being executed by an Oldroyd Universal machine which also shears the coal in the center of the face. One long shothole on either side of the shearing cut and one short hole in each rib are employed to break down the coal.

HEAVY SHOOTING ASSURES EASY LOADING

In this mine, shotholes are charged rather heavily for two reasons: First, the coal on reaching the outside must be carried to a railroad siding on the farther bank of a stream by an aerial tramway, the buckets of which are too small to hold large lumps. Second, the circular cut made by the mining machine in a width of 20 ft. leaves two tight corners, which require two light rib shots.

Satisfactory shooting for mechanical loading presents problems all its own. In this particular mine,



Fig. 2—Breaking Down a Hanging Shot

Rugged construction and massive weight enable the machine to disrupt masses of standing coal as shown. Though this process is slower than shoveling loose coal from the mine floor it affords a coarser product. The hand shoveler seen in this illustration saves the machine much time by gathering up stray pieces of coal that the machine could reclaim only with difficulty.

as has been stated, the coal is undercut and center sheared to a depth of about $8\frac{1}{2}$ ft. The two light rib shots already mentioned are sufficient to bring the coal away from the sides and roof, but they do not break and roll it out on the floor. They result rather in a true hanging shot, most of the coal remaining in two blocks upon either side of the shear cut. These are broken away from the roof and show some evidence of a slight separation and movement along the cleavage planes.

An attempt to load out these blocks shows that this apparent shattering does not extend throughout the entire mass, as certain portions stubbornly resist, although they finally succumb to the powerful action of the revolving dipper. This shooting, however, gives a product with a low percentage of slack, the quantity of coal less than $\frac{3}{4}$ in. in size making a proportion of the whole product from 7 to 10 per cent less than that obtained with hand loading. Center shearing and light shooting, although not extensively practiced, has many strong advocates among present-day mine managers. Lumps weighing almost 200 lb. each are successfully handled by this machine. In fact, the size of the individual pieces loaded appears to be limited only by the width of the dipper and the conveyors.

The method of handling cars in the Robert mine is plainly shown in Fig. 4. A trip of empties is stored in room 4, adjacent to room 5 where coal is being loaded. A turnout connecting the tracks in adjoining

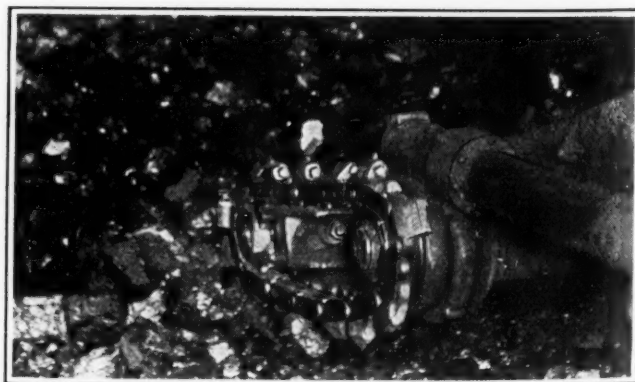


Fig. 3—Cutter Chain Driving Feeding Device

Pick bits carried by this chain clear a passage in the coal pile for the conveyor bearings. This chain, together with a similar one on the opposite side of the machine, rotates the revolving dipper on the gathering head.

rooms is laid in the crosscut most conveniently located to the face. This facilitates the storage of a trip of empties inby and provides clearance beyond the turnout switch in the room being loaded out. In order to accomplish its purpose most effectively, such a crosscut turnout should be from 75 to 150 ft. from the working face.

TWO LOCOMOTIVES CHANGE CARS QUICKLY

Two 5-ton storage-battery locomotives constantly attend the loading machine. Barring delays arising from changing trips, from faulty track or rolling stock, the only time consumed in changing cars is that required by a loaded car in clearing the turnout in the crosscut, or that necessary to push an empty from the turnout to the loading machine. The ease with which cars may be changed may be traced in rooms 4 and 5 of Fig. 4.

The motor A with a loaded car clears the turnout in room 5 on its way to the butt entry where the loaded cars are stored. Motor B pushes an empty car to the loading machine. While this is being filled, motor A

Table I—Time Study of Loading Machine in Room 4				
Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	55	35	...	...
2	35	40	...	...
3	30	40	...	...
4	45	25	...	...
5	40	35	...	...
6	40	25	...	...
7	30	35	...	...
8	45	35	230	Locomotive derailed
9	45	35	55	Defective mine car
10	45	45	...	...
11	45	20	...	...
12	55	85	...	Changing trip
13	55	25	...	...
14	65	20	...	...
15	115	25	...	Cleaning up room
16	80	20	310	Adjusting headlight on machine
17	90	35	...	Cleaning up room
18	125	35	...	Cleaning up room
19	150	...	...	Cleaning up room
Total.....	1,190	615	595	
Average.....	63	34	31	

uncouples its loaded car on the entry in the clear of room 4, goes into this room, couples onto an empty and waits in the crosscut for its turn at the machine. Aside from a short backswitch while dropping a loaded car on the entry and coupling to an empty car in the room, the two motors move in closed circuits.

I timed with a stop watch the performance of the loading machine in rooms 4 to 7 inclusive (see Fig. 4). My observations extended from 9:04 a.m., when loading began in room 4, until noon, when work ceased after nine mine cars had been loaded in room 7. They thus extended over a period of 176 min. In totaling the stop-watch readings a minus error of 1½ min. was noted. This arose from protracted periods being read in whole minutes and not in minutes and seconds. The error amounts to less than 1 per cent and consequently may be neglected.

Readings showing the operation of the machine, loading periods, time necessary to shift cars and time lost in rooms 4 to 7 respectively, are shown in Tables I to IV. Five minutes were taken to move the machine from room 3 to room 4, and an equal length of time was consumed in making ready for the machine. In room 4, 19 cars containing a total of 43 tons were loaded in 40 minutes. Five minutes was consumed in moving the loading machine to the face of room 5, a distance of 740 ft., and 6 min. was consumed in making ready for loading operations. In this room

Table II—Time Study of Loading Machine in Room 5				
Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	65	15	...	...
2	45	45	...	...
3	50	15	...	...
4	50	30	...	...
5	40	30	...	...
6	45	70	...	...
7	40	20	...	...
8	75	150	...	Changing trip
9	50	35	...	...
10	60	20	...	...
11	70	30	...	...
12	60	65	...	...
13	55	20	...	...
14	60	30	...	...
15	100	25	...	Cleaning up room
16	80	25	140	Car derailed
17	160	45	...	Cleaning up room
18	140	...	...	Cleaning up room
Total.....	1,245	670	140	
Average.....	69	39	8	

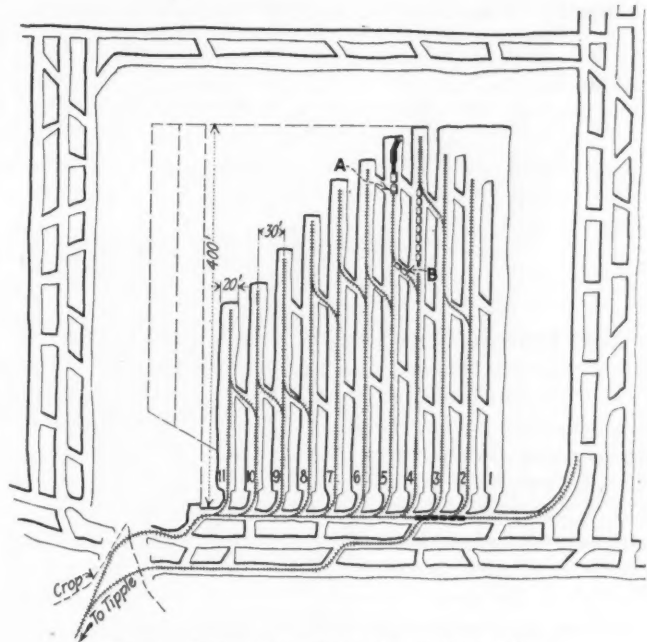


Fig. 4—Room Layout in the Robert Mine

When machine loading was started in this mine it was thought that room coal could be loaded much faster than pillar coal. Experience has shown that there is little difference in the time required to produce coal from either of these two sources and consequently instead of driving 20-ft. rooms on 30-ft. centers it is the intention in the future to make the pillar thickness equal to the depth of at least two cuts.

eighteen cars containing 40 tons of coal were loaded in a period of 34 min. The loading machine was moved to the face of room 6, a distance of 700 ft. in 6 min., and again 5 min. was required in making ready for loading. Here eighteen cars containing 40 tons were

Table III—Time Study of Loading Machine in Room 6				
Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	60	40	...	...
2	35	30	...	...
3	55	35	...	...
4	85	40	...	...
5	40	190	...	Changing trip
6	50	30	...	...
7	60	50	...	...
8	55	30	...	...
9	45	45	...	...
10	50	40	250	Adjusting machine
11	35	55	...	...
12	60	25	...	...
13	60	40	...	...
14	45	35	...	...
15	90	50	...	Cleaning up room
16	70	25	...	Cleaning up room
17	180	20	...	Cleaning up room
18	250	...	...	Cleaning up room
Total.....	1,105	580	250	
Average.....	61	34	14	

loaded in a total time of 34 min., the loading machine was then moved to the face of room 7, a distance of 500 ft. in 5 min. In 9 min. the machine was made ready for loading operations in this room, and in 22 min. thereafter nine cars containing 20 tons of coal had been loaded.

"Making ready" included inspection, minor adjustments and lubrication of the loading machine, also repairing track when necessary and sumping into position. Coal in the face of room 6 was shot down in better shape for machine loading than that in any other room; that in the face of room 7 was in the worst shape. Because the face of room 7 was not sufficiently shot, the rate of loading was lower by over 30 per cent, than in room 6.

The wisdom of using two locomotives is readily dis-

Table IV—Time Study of Loading Machine in Room 7

Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	60	30	205	Coal on track
2	80	30	...	.....
3	55	35	...	.....
4	60	30	...	.....
5	60	30	130	Adjusting track
6	135	35	...	.....
7	55	35	...	.....
8	115	30	...	.....
9	90	25	...	.....
Total.....	710	280	335	
Average....	79	35	37	

cernible from an inspection of Tables I to IV inclusive. Reading down the car-shifting column in these tables it will be noted that the time consumed in changing cars generally varies from 15 to 35 sec., depending upon the distance of the turnout from the face. In a few cases as much as 70 sec. was consumed in this operation. Naturally when trips were changed more time was required. Long periods consumed in car shifting in any one table arose from the use of old mine cars that were in poor repair. Rolling stock in proper condition and well-kept track should make it possible to rely on being able to change cars in 30 sec.

In Table V are shown the totals for each phase of the loading operation for each room as well as a grand total for all rooms. From it the following facts may be derived: Actual loading of cars consumed 40.6 per cent of the total time observed; shifting took 20.6 per cent; moving the machine required 12 per cent; making ready, 14.2 per cent; the time lost was 12.6

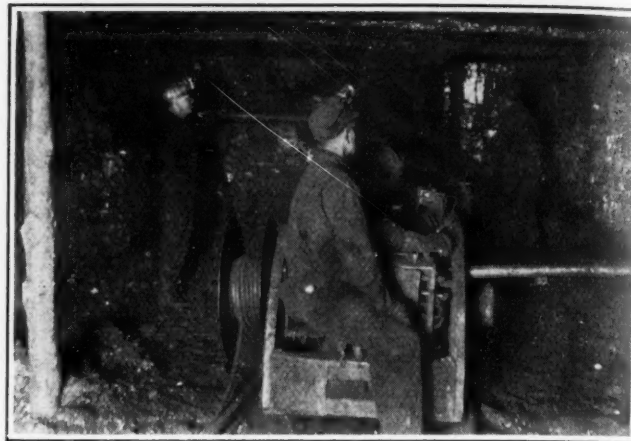


Fig. 6—Starting a Cut in a Room

The top is cut and the center sheared with a Universal machine at this mine. About 1 ft. of top coal is left up to protect the roof. Center shearing makes more bug dust but gives more lump coal per room cut, than could be obtained without it.

per cent of the whole time. During 176 min. 64 cars containing 144 tons of coal were loaded at the rate of 39.1 tons per hour. This rate of production if continued throughout a full shift, would yield an output of almost 400 tons. It is not maintained throughout the working day, because the mine cars are old and not fitted for the work they are called upon to perform. They were constructed originally to hold 1½ tons, but by the addition of sideboards their capacity has been increased to 2¼ tons. Another obstacle that interferes

Table V—Totals of Tables I to IV Inclusive

Room Number	Time of Moving Machine Seconds	Time of Making Ready Seconds	Number Cars Loaded	Loading Time Seconds	Number Cars Shifted	Time of Shifting Cars Seconds	Time Lost Seconds
4	300	300	19	1,190	18	615	595
5	300	360	18	1,245	17	670	140
6	360	300	18	1,105	17	580	250
7	300	540	9	710	8	280	335
Total....	1,260	1,500	64	4,250	60	2,155	1,320
Average..	320	400	..	66*	..	36*	.....

* Per car.

with the attainment of this 400-ton output is the aerial tramway shown in one of the accompanying illustrations which transports the coal from the dump to the railroad cars. This means of transportation has a maximum capacity of 375 tons in 8 hr. It is responsible for much of the time lost.

Table VI, covering seventeen working days in

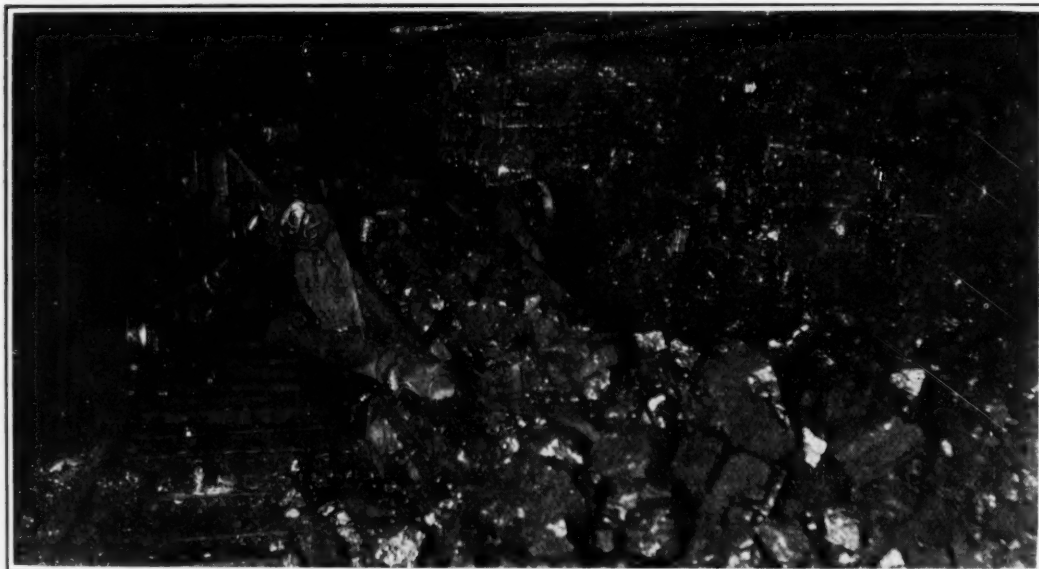


FIG. 5

A Slab Cut

When track is maintained along the full length of a slab cut the coal rolls out over it making the work of the shoveling machine difficult. The present practice is to add short sections to the track as the machine advances, thus allowing the revolving dipper to work on an unobstructed bottom. The operation of the machine is thus facilitated, and doubtless some degradation of the coal also is avoided.

Table VI—Summarized Record for Seventeen Working Days in October

Working Day	Tonnage Produced	Hours Worked	Hours Delayed	Remarks
1	215	5	3	Repairing loader
2	377	8	..	..
3	325	7½	4	Repairing loader
4	355	8	..	..
5	325	8	..	..
6	167	4½	3½	Delay not caused by loader
7	275	6½	1½	Delay not caused by loader
8	307	7	1	Repairing loader
9	370	8	..	..
10	305	8	..	..
11	285	6½	1½	Delay not caused by loader
12	160	5	3	Delay not caused by loader
13	157	2½	5½	Delay not caused by loader
14	370	8	..	..
15	325	8	..	..
16	220	6½	1½	Delay not caused by loader
17	275	6½	1½	Delay not caused by loader
Total.....	4,913	113½	22½	
Average....	289	6.68	1.32	

October, lists the tonnages obtained, hours worked, time lost and the reasons therefor. On an average day during this period 16½ per cent of the working time was lost because of miscellaneous delays arising from equipment. Less than one-fourth of this loss was occasioned by trouble with the loading machine.

The loading-machine crew consists of three men, two runners and a third man stationed beside the forward

cut. Of course, if this coal contains a large quantity of small pieces it would be as hazardous to shoot the coal over it as it is to fire a shot over a pile of bug dust.

It should be remembered that the ratio of operating time to tonnage obtained is the chief factor governing the efficiency of a loading machine. Because a tonnage equivalent to the capacity of the machine during a period of at least five minutes is lost in gathering stray lumps, two men with shovels might be employed profitably to relieve the machine of this duty. It is probable that no loading machine will ever be built that will perform all the functions of a human loader, or be sufficiently flexible to match the co-ordination of man's brains and muscles. All that any machine can ever do is to approach this ideal. The deficiency of the coal loader must be made up by muscular effort.

TWENTY-FOUR MEN MINE 289 TONS DAILY

The following men were employed both inside and outside the Robert mine in order to produce the tonnage shown in Table VI: One foreman, two loading-machine runners, one loading-machine helper, two motormen, one trip rider, two cutters, four tracklayers, two timbermen, one blacksmith, four tipples men, one elec-



FIG. 7

Room Face

This is the face as it appears after the machine has completed its loading. It is unprofitable to employ the machine to clean up the last bit of coal in a room. The last two cars produced from this place took as much time to load as did the first seven. What coal remains at the face will be loaded out with that from the next cut.

conveyor who shovels up coal missed by the machine. Occasionally a fourth man for cleaning up would be desirable, as the time lost in operating the loading machine at a slow rate when gathering up stray lumps of coal, might be more profitably spent at points where the coal is deeply bedded. An inspection of Tables I to VI will show this fact conclusively.

Reading down the car-loading column in each of these tables, it will be noted that mine cars (capacity 2½ tons) were loaded in as short a time as 30 sec. Nevertheless, the loading period per car attains a maximum of 250 sec. It is true that a portion of this excess time is consumed by the loading machine in dislodging tight coal, but more than half of it results from the necessity of maneuvering the machine about in order to gather up sparsely strewn lumps. This especially is noticeable when loading the last two or three cars from a room. Even then a small quantity of coal is left for recovery with the next cut. Because of the long time necessary for loading the last few tons of coal from a room, it would appear advisable to leave much of this material for recovery with the next

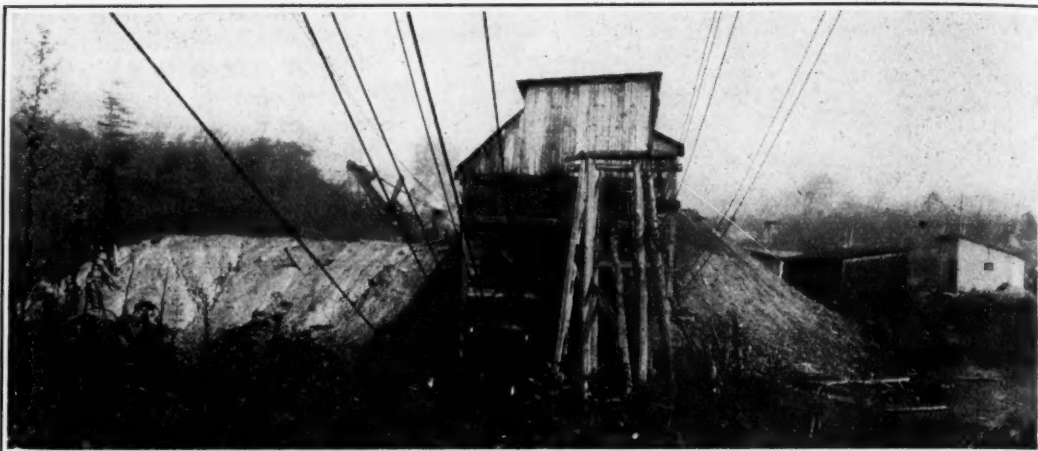
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trician, two shotfirers and one watchman. These twenty-four hands loaded an average of 289 tons per working day during October, or 12 tons per man. Of course, no development was attempted when rooms were being worked. Consequently the output was high as compared with what might be expected if both rooms and headings were being driven simultaneously. The additional labor necessary for development work in this mine, would not lower the daily output per man to less than 10 tons. With a 5-ton car, the daily tonnage per man employed in mining operations would probably range from 10 to 15 tons.

The advantages of a large mine car when used in conjunction with mechanical loading are apparent to the officials of this mine. General Superintendent Whalen intends to adopt a 5-ton car with a 48-in. track gage as standard for a new mechanically operated mine that his company contemplates opening. With cars of this capacity, the Oldroyd machine ought to load 500 tons in 8 hr. under conditions similar to those existing in the Robert mine and with the same number of employees. To produce 500 tons, the coal from twelve

FIG. 8
Tipple and
Tramway

This method of transporting the coal from the dump to the railroad car already is beginning to limit the capacity of the loading machine, for as at present operated it cannot carry more than 375 tons in 8 hr. Furthermore it cannot handle large lumps.



room cuts would have to be loaded into 100 mine cars.

Table V shows that a 2½-ton car may be loaded in an average time of 66 sec. At this rate of loading, a 5-ton car could be filled in 138 sec. or 100 cars in 13,800 sec. This represents 48 per cent of an 8-hr. day. It is calculated also from an analysis of the facts set forth in Table V, that about 11 per cent of an 8-hr. day would be spent in shifting cars, and not over 12 per cent in moving the machine, leaving 29 per cent of the time for miscellaneous delays. This would appear to be an ample allowance.

Little success has been reported thus far in drawing pillars with mining machines. Possibly the slow progress attained in this phase of mining operations is attributable to a lack of persistence and official supervision in making the necessary experiments. There is little doubt, however, but that some day pillars will be drawn thus, and inasmuch as they can be removed

much more rapidly with loading machines than by hand, the retreat will be rapid, lessening the danger from falling roof and rendering pillar extraction safer than it is today. It is possible, also, that less slate will have to be handled.

PILLAR COAL MUST BE SLABBED

It is highly probable that whatever method of mining is adopted, the loading of pillar coal by machine will involve slabbing. Several reasons dictate the adoption of this method. In the first place, a slab cut produces more coal than any single cut made in driving through a pillar, leaving one or more stumps that must be recovered before the next cut is started. Consequently a slab cut expedites recovery and assures safety. It also eliminates sharp curves in the track and provides a more suitable working place for the loading machine.

Pillars are being extracted by loading machine in the Robert mine. The results thus far achieved have been highly successful, and the work has progressed to such a point as to prove that the practice is entirely feasible. Thus Mr. Whalen states: "This work has proceeded without any difficulty whatever and the machine has never been forced to retreat because of unfavorable roof conditions. We feel that we have already demonstrated conclusively that it is possible to draw ribs with this type of loading machine in mines where what might be termed a medium roof prevails."

Though at the initiation of its experiments the company was hopeful of recovering pillars by mechanical loading, it anticipated that greater difficulty would be encountered in loading pillar coal than in loading that obtained from room faces. Accordingly, rooms were driven wide on as narrow centers as the roof would allow. Twenty-foot rooms on 30-ft. centers were therefore adopted as standard, 10 ft. of pillar being taken as the minimum width that safely would hold the roof.

The withdrawal of these pillars is illustrated at A in Fig. 9. The track is first shifted as near to the rib as possible, so as to facilitate the work of both the cutting and loading machines, which operate from it. The pillars are mined by slab cuts on the inby end. The length of such cuts varies from 10 to 30 ft., depending upon the condition of the roof. An 8½-ft. cut leaves a rib about 1½ ft. thick, which, though frequently shattered by shooting and roof pressure, generally requires some pick mining. Some hand shoveling also is necessary in order to place the coal from this rib within reach of the loading machine. The closed end of a pillar cut is sumped on a 45-deg. angle to facilitate machine loading at this point.

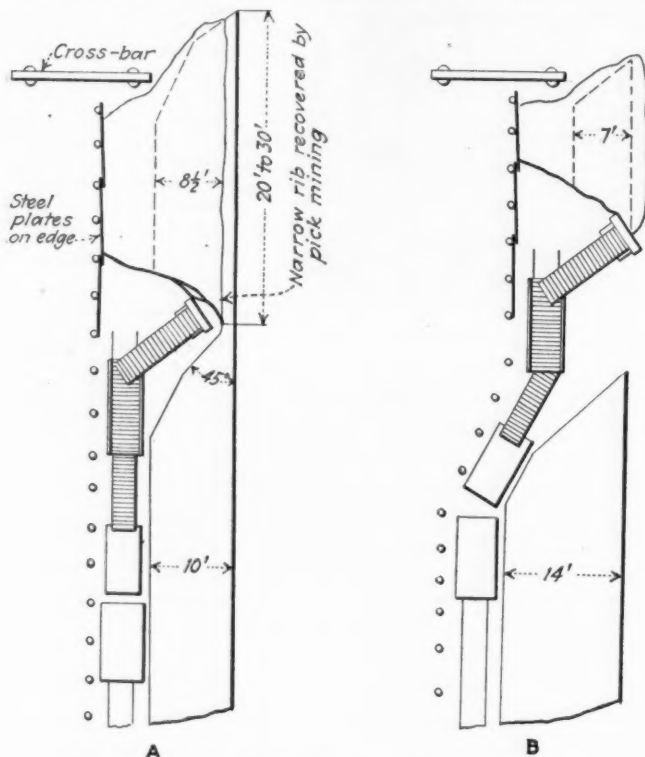


Fig. 9—Recovering Pillars by Machine Loading

Pillars are drawn by slabbing without stump protection. The method now used is shown at A. The 10-ft. pillars are slabbed to a depth of 8½ ft. the remaining coal being recovered by pick mining. The probable future method of pillar drawing is shown at B. The pillar width will be increased to 14 ft. providing for two 7-ft. slabbing cuts. The first of these will be recovered in a manner similar to that now employed, but the loading of the second will require a curve in the track that will enable the machine to take a position close to the cut.

No track is laid along that portion of the pillar being mined. As the cut is loaded out and the machine moves forward, short rail sections are added to the track. This enables the dipper of the machine to load on an unobstructed bottom.

A row of props is set along the track. Against these, and flanking a slab cut, three or four steel plates are placed on edge, thus confining the coal rolled out from the cut in shooting. A heavy crossbar, and two strong posts are erected abreast of the gob end of a retreating pillar to assist the props in holding the drawslate and other rock immediately overlying the coal.

In fifteen working days the pillar between rooms 1 and 2 (see Fig. 4) was shortened 230 ft.; that between rooms 2 and 3, was drawn back 120 ft.; that between rooms 3 and 4 was shortened 110 ft.; and that between rooms 4 and 5 was retreated 30 ft. This recovery

is equivalent to that of a 10-ft. pillar having an aggregate length of 490 ft., yielding about 1,370 tons. Only one-fourth to one-third of the time required by hand methods is necessary for drawing pillars by machine. As a result, less pressure is observed on the ends of the pillars nearest the gob, and working conditions generally are far safer than in ordinary pillar sections.

Inasmuch as this company has proved that pillar coal can be mined by a loading machine about as conveniently as room coal, it now believes that 20-ft. rooms should be driven on centers of 34 ft. or wider. If the 14-ft. room pillar thus formed could be mined through by two slab cuts each having a depth of 7 ft., the first cut would be mined out in the same manner as that shown at A in Fig. 9. In order to bring both cutting and loading machines within reach of that portion of the pillar taken in the second cut, it will be necessary to curve the track inward as shown at B in this figure.

Great Britain Revises Its Mine Electrical Rules

Cannot Use Electricity Without Permit—May Transmit Current Above 650 Volts but When Used Must Be Stepped Down Below That Voltage

BY C. H. S. TUPHOLME
London, England

NEW regulations have just been issued by the Minister for Mines governing the use of electricity in coal mines, the main features of which may be summarized with advantage.

If an operator intends to introduce any electrical equipment into his mine, or into any ventilating district in his mine, or wishes to re-introduce electricity into a shaft where the use of electricity has previously been ordered out, he must give notice in writing to the government inspector of the district. If this inspector does not object in writing within a month, then the operator may regard his silence as consent, and may go ahead with his plans. The only exceptions to this are telephones and signaling apparatus.

Every coal-mine operator is obliged during January of every year to make out a return of all his electrical equipment, giving details of its size and type. He is also obliged to keep up to date a scale plan of the mine showing all the fixed electrical apparatus. This plan must be produced on the demand of an inspector.

The usual notices, constructed of durable material, must be exhibited where necessary, that is, prohibiting unauthorized individuals from handling electrical apparatus, giving directions in case of fire, directing the treatment of victims of electric shock, and instructing as to the manner by which communication can be established with a qualified individual in charge of the main switch of the underground electric system. The last notice must be on view at the shaft bottom.

SECONDARY LIGHTING IN HAZARDOUS PLACES

In locations lighted by electricity, where failure of the light might lead to danger, some type of lamp must be kept continuously burning; there must be an efficient telephonic system between the main switchgear and the main distributing center in the pit; and fire buckets filled with sand must be kept wherever there is any electrical apparatus.

If equipment such as transformers or switchgear are likely to be damaged they must be kept in a separate compartment which must be constructed of fireproof material and must also always be kept dry and free from obstruction.

Every part of the electrical system in the mine must be efficiently insulated, except that (1) the neutral point of a polyphase system may be grounded at one point only, (2) the mid-voltage point of any system, other than a concentric system, may be grounded at one point only, and (3) the outer conductor of a concentric system must be grounded. All generators, transformers and motors, including the portable type, must be connected to a grounding system at the surface of the mine. No conductor of a grounding system may be less than 0.022 sq.in. cross-sectional area.

Where electricity is distributed at a higher potential than 650 volts, it must not be used without being stepped down to below 650 volts and in fact to 250 volts, except in fixed equipment in which the high-pressure parts are stationary. Alternating-current motors smaller than 20 hp. must be supplied with energy through a transformer which will step the potential down to less than 650 volts.

Switchgear and all electrical connections must be rugged enough to withstand rough usage, must be protected against the lodgment of dust on or near live parts, and must be so constructed that there is no open sparking.

NO SWITCH ALLOWED ON OUTER CONDUCTOR

If a concentric cable is used no switch or fuse may be placed in the outer conductor, unless it is a reversing switch installed where the current is being used. Switches or fuses may, however, be used to break connection with generators or transformers, providing there is no interference with the grounding system of the outer conductor.

All cables, except those for portable apparatus, must be insulated and supported at intervals to protect them from damage. Where the roadway is used for mechanical haulage or where there is any explosion hazard concentric cables, two-core or multi-core cables must be protected by a metallic covering if the potential exceeds 250 volts.

Provided a direct-current system is used not exceeding 650 volts, two single-core cables protected by metal may be used for any circuit, provided the metal cover-

ings are bonded together by ground wires not farther than 100 ft. apart.

An operator working an electrically-driven coal-cutter must not leave the machine while it is working, and he must, before leaving the working place, satisfy himself that the current is cut off from the flexible trailing cable which supplies the coal-cutter.

Current from lighting or power circuits must not be used for firing shots, and cables used for this purpose must not be allowed to come into contact with other conductors.

Haulage by electric locomotives on the overhead wire system is prohibited in any coal mine. Storage-battery locomotives may be used only when permission in writing has first been obtained from the Board of Trade.

Every mine where electricity is used must employ a properly qualified electrical engineer, and if this official is absent for more than one day, the manager must appoint in writing an efficient substitute. The electrician must maintain a daily log book on the prescribed sheets, and this book must be produced on the demand of an inspector.

Boiler Economies for Coal Men Exhibited at Power Show

Settings, Valves and Meters Being Devised to Meet
Trying Demands of Modern Economical
High-Temperature Operation

THOSE who visited the Power Show held in New York during the week of Dec. 1 to 6, in conjunction with the annual meeting of the American Society of Mechanical Engineers, could scarcely fail to notice how greatly the number of exhibitors of certain products has increased in recent years. The general quality of the products exhibited also apparently had shown vast improvement.

Perhaps the number and diversity of three items or types of equipment impressed even the casual visitor more quickly than any others. First, a wide variety of refractories were shown. These included many kinds of firebrick in both regular and special shapes as well as insulating brick to be incorporated in the boiler or furnace walls to prevent radiation, also baffle brick, and fireclays and cements of many types. Many such refractories have doubtless been developed to meet the exacting requirements imposed by high boiler overloads as well as the extreme temperatures obtainable by the use of powdered fuel.

VALVES AND FITTINGS IMPROVED

Pipe valves and fittings also were much in evidence. Only a few years ago extra-heavy cast-iron fittings were considered amply strong for practically any power plant. At this show were exhibited not only steel-casting valves and fittings but also those made from steel forgings. High pressures and superheats demand a type of fitting and even a variety of pipe joint that was totally unnecessary less than a score of years ago.

The third class of power plant apparatus to impress the visitor by its diversity was what might be termed measuring or indicating equipment. In this type might be enumerated, pressure and vacuum gages, high- and low-water alarms, water gages, try cocks, thermometers, hydrometers, psychrometers, pyrometers, draft gages, flue-gas indicating and analyzing apparatus, air meters,

steam meters, water meters and similar devices in vast and formidable array.

Exhibitions of this kind as a rule furnish a fairly reliable index of the progress of the industry, trade, calling or profession represented. Power generation today is an exact science and the modern steam boiler is capable of scientific control and manipulation. The chief requisite for firing a boiler was once considered to be a strong back. Today the actual firing is done by a stoker or, in the case of powdered coal, by an air blast. The fireman must, however, preserve the balance between rate of fuel consumption and load, supply the air requisite for combustion but admit as small an excess as possible, regulate the draft, and otherwise so control the fire as to obtain uniformly the best results possible.

SCIENTIFIC KNOWLEDGE NECESSARY

This cannot be done blindly or by guess—each move and adjustment must be predicated upon exact scientific knowledge or no exact scientific results will be achieved. He will be most successful as a power producer, who, by means of scientific instruments ascertains the conditions existing in the boilers and furnaces intrusted to his care and then modulates these conditions to suit the load to be carried and in such manner that the maximum proportion of the heat energy contained in the fuel is transformed into useful work.

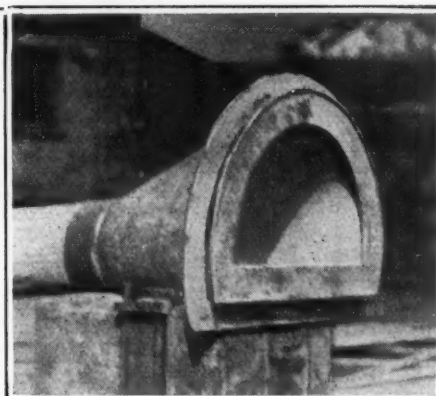
At the mines coal is less valuable than it is anywhere else except in the ground. Refinements in plant equipment and operation that might be fully justified at an industrial establishment located some distance from the point of fuel origin may not find economic justification at the mine mouth. Nevertheless, if the coal-producing companies generally at their plants engaged such men and installed such equipment for obtaining low-cost energy, as sound economics fully warrant, their costs for coal produced, in at least many cases, would be lessened appreciably. In other cases, being able to generate their own energy cheaper than they could buy it, they would be enabled to maintain their own plants and thus would be freed from the exasperation and expense arising from the more or less frequent failures of power which companies sustain who purchase their energy from a central station.

VACUUM CLEANER FOR SAMPLING COAL DUST—Experiments to determine the feasibility of sampling coal-dust accumulations in mines by means of some method of vacuum cleaning are being conducted by the Pittsburgh Station of the U. S. Bureau of Mines. To separate the dust from the air, cotton flannel is used in the domestic vacuum cleaner. Cotton flannel allows too much dust to escape, and alundum filters are regarded as more efficient. Tests will be made by the Bureau of Mines to determine how much dust passes filters of the latter type.

SAFETY ASSOCIATION GROWS RAPIDLY—There are now 94 local safety chapters of the Joseph A. Holmes Safety Association located in the different mining districts of the country. Each of these local chapters has a safety director who has been specially trained in the U. S. Bureau of Mines methods of teaching mine rescue and first aid. These safety directors instruct classes of miners, thus supplementing the training work conducted by the Safety Service of the U. S. Bureau of Mines.

Pittsburgh Coal Co. Evolves Dust Distributor

Nozzle Projects Dust to All Surfaces in Proper Proportion—Mechanical Mule Draws Train at Suitable Speed for Complete Distribution in One Application



BY ALPHONSE F. BROSKY
Assistant Editor, *Coal Age*,
Pittsburgh, Pa.

FOR MANY months the Pittsburgh Coal Co. has been building rock-dust distributors in its central repair shop and simultaneously rock dusting its mines. Seven of its mines have already received dust treatment, and the work will be extended to others as the expediency for doing so becomes apparent. One machine after another has been built, tried out and torn down for alteration, only to give way eventually to some other type that proved itself superior. Numerous tests were made in the yard surrounding the company's Library shop, in the progress of which tons of rock dust were blown into the atmosphere. A satisfactory arrangement for feeding the rock dust uniformly and continuously from a hopper to the blower tube and discharge nozzle was devised only after numerous changes had been made. Nozzles of many kinds were tried before the type now being used was accepted.

The Pittsburgh Coal Co. now has a rock-dust distributor that not only lays dust so that it will lodge uniformly on the roof, ribs and floor, but does its work rapidly and with a minimum of labor. Even so, the company does not claim to have a perfect machine, though the present device has proved satisfactory.

On Nov. 24 the machine was moved from Montour No. 4 to the Mansfield mine where it was put to work that night without much advance preparation. In six hours it distributed 203 sacks of limestone dust, each weighing 80 lb., along 7,000 lin. ft. of entry, laying 2.3

lb. per lin. ft. It is capable of discharging 1,500 lb. of dust in 12 minutes of continuous running. The dust train, composed of the machine and two mine cars filled with sacks of rock dust and pulled by a small, special-type, low speed locomotive, was manned by two men.

The rock-dust distributor is shown in Fig. 1. It is protected by pending patents in the names of three of the company's mechanical men who are responsible for its design. Its overall height above the rail is 40 in. From an open-top hopper, having a capacity of 18 sacks or about 1,500 lb., rock dust is fed to the blower tube by a 4-in. worm or screw conveyor located in the hopper bottom and having a 45-deg. pitch. Half of its length is incased in a tube connecting with the blower tube. Rock dust is forced into and through this tube by the revolving worm, this arrangement serving to prevent the establishment of any back pressure from the blower tube into the hopper. Consequently the tube incasing this worm is called the baffle tube.

PACKING OF DUST PREVENTED

The tendency of a worm arranged as above described is to crowd the dust to one side of the hopper in the direction of translation and to pack it at a point directly over the baffle tube. This is not desirable and to overcome it two other worms are placed above and on either side of the feed worm. These revolve in a direction opposite to that of the main worm, overcoming any tendency of the dust to be crowded in the direction of the feed. Because these two secondary worms are wholly exposed and the feed worm is exposed only on top, they exert a greater action on the dust than the feed worm and keep the dust in constant contact with it.

Lines drawn from center to center of the three worm shafts form a triangle; the axes of the two secondary worms lie in a horizontal plane. The feed worm is driven at 110 r.p.m. by a chain from the shaft of the blower which, in turn, is direct-connected to a motor. The secondary worms are driven at 55 r.p.m. by gears from the shaft of the feed worm. By these means the feed is made positive and there is no arching of dust.

Air is supplied by a 30-in. blower of the company's own design having 3-in. blades. This machine has a normal capacity of about 8,000 cu.ft. at a water gage of 13 in., this being equivalent to the load that a 15-hp. motor (one of the company's standard sizes) will safely carry.

The discharge head or nozzle of this machine is shown in the headpiece. It is of the stationary type,

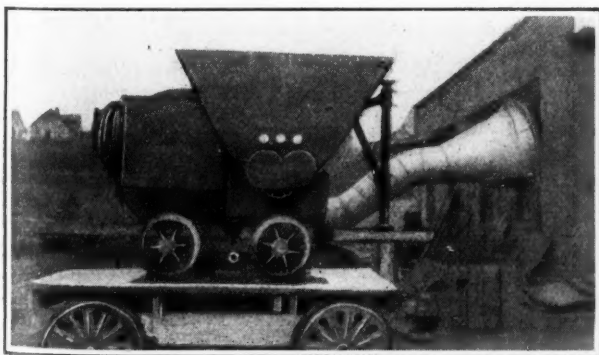


Fig. 1—The Dust Distributor Car Complete

About 1,500 lb. of limestone dust may be placed in the hopper. This is fed at a uniform rate to the fan blast by means of a worm conveyor while two similar conveyors prevent packing of the dust at one side of the hopper base. About 15-hp. is required to operate this machine.

NOTE—The peculiar looking device shown in the headpiece is the cone-shaped nozzle of the mine dusting machine. It is composed of an inner and an outer shell adjustable with respect to each other. Dust is projected at right angles to the major axis of this nozzle and in greater quantity per linear in. along the curved portion of the periphery than along the straight portion.



Fig. 2—End-on View of Nozzle

As may be seen the dust is blown out at right angles to the longitudinal axis of the nozzle. The dust thus takes the shortest route to the several surfaces of the mine passages to be coated.

cone-shaped except that the bottom is flattened to make its periphery similar in general outline to that of an entry. Inside of the outer shell of the head is another shell of the same general shape but having a more obtuse angle at its vertex. This inner shell can be adjusted inward or outward to decrease or increase the width of the opening surrounding the periphery of the head. The outer end of the inside shell or jet is provided with a flare plate. As the dust enters the head from the blower tube it is confined between the inner and outer shells and consequently is forced outward to the nozzle opening where its direction of travel is again changed by the flare plate.

DUST TRAVELS SHORTEST DISTANCE

This diverts the particles of dust to a direction perpendicular to the longitudinal axis of the nozzle; that is, it so directs the dust that its travel, when the machine is working on an entry, is perpendicular to the surface of the roof, ribs and floor respectively. By this means the distance that particles of dust must travel in order to reach the surfaces to be covered, is made the shortest possible and the force of impact is

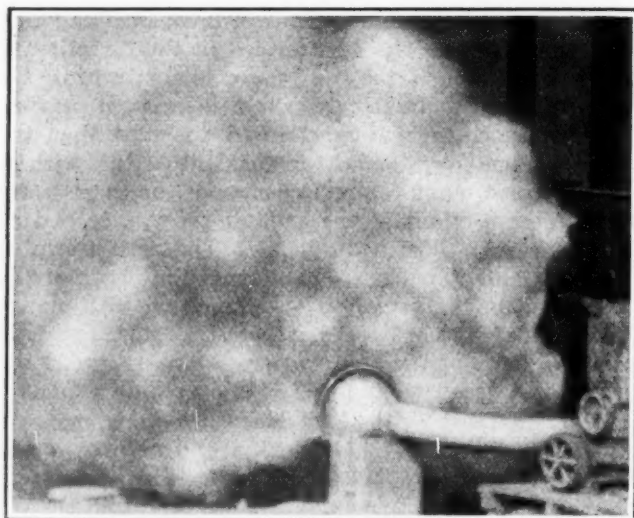


Fig. 3—Cloud of Dust Blown by Machine

Much experimentation in the evolution of this machine was carried on in the open air. This shows one of the tests being conducted in the yard of the Library shop. The capacity of the machine may be judged from the density of the dust cloud produced.

the greatest. This action is clearly illustrated in Figs. 2 and 3.

The width of the dust discharge opening at the extremity of the nozzle flare is adjustable within limits. A rectangular plate provided with slotted holes to facilitate adjustment is attached by bolts to the lower or straight portion of the periphery, and a curved plate performs the same function for the circular portion. In practice the opening along the circular section of the nozzle is adjusted to $\frac{7}{8}$ in., while that of the straight section to only $\frac{3}{8}$ in. The reason for this difference should be apparent. Because some of the dust which is directed to the ribs and roof of an entry falls to the ground, it is not necessary to project as much dust to the floor as to the rest of the perimeter of the entry. The diameter of the circular portion of the nozzle is 30 in. and the length of the chord on the bottom is 28 in.

Flexible joints are employed at both ends of the connecting tube, that is, where the blower tube joins the connecting tube and where this latter joins the head. By this means great flexibility is obtained. Thus the discharge head or nozzle can be raised, lowered, swung to either side or made stationary in any position. It will be noted from an inspection of Fig. 1 that the diameter of the tube connecting the blower with the head or nozzle is gradually increased. The blower tube (not shown in this illustration), also in-

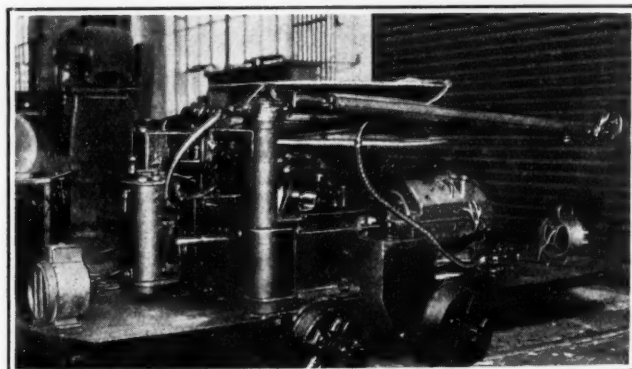


Fig. 4—Special Dust-Train Locomotive

The walk of a horse or mule or the slowest progress of a mine locomotive is too rapid for effective dusting. Consequently this special locomotive was constructed, largely from the odds and ends available at the Library shop, for the express purpose of handling the dust train. It is of small power and low speed, yet it would be advantageous if it could move even more slowly. The next machine of this kind to be constructed will be designed so as to secure this slower movement.

creases in diameter outwardly from the blower toward the discharge head.

For this reason, as the air moves from the blower toward the nozzle, it expands and creates a suction rather than a back pressure in the baffle tube leading from the hopper to the blower tube. When the nozzle is removed and the blower operated at capacity, a vacuum of $2\frac{1}{2}$ in. is registered in the baffle tube. With the nozzle in place and adjusted to operating position a vacuum of $\frac{1}{2}$ in. is obtained. It is because of this suction that the hopper need not be entirely closed.

It has been discovered that the speed of a distributor in rock dusting should range from 40 to 100 ft. per min. The ordinary walk of a horse or mule is too rapid and halting for this purpose while the dust discharged in an entry is likely to frighten an animal and at times render him unmanageable. The slowest speed of an ordinary locomotive with all its resistance inserted in the power circuit is too great for the operation of rock dusting. Obviously therefore, some other device must

be employed for this work. The Pittsburgh Coal Co. has developed and begun using what it calls a "mechanical mule." This is nothing more than a low-speed locomotive, one type of which is shown in Fig. 4.

The machine shown was constructed largely from odds and ends found in the Library shop. Briefly, it is chain-driven from a 5-hp. motor, both axles being propelled by this means. Its ordinary speed ranges from 100 to 300 ft. per minute, but this can be reduced to 60 ft. per minute by inserting resistance. It is mechanically controlled by a clutch. The capacity of the motor driving this machine is sufficient for the purpose; if anything, it is slightly too large. The next locomotive of this kind will be built to attain a lower speed than the one shown in Fig. 4.

This mechanical mule is provided with both a trolley and a cable reel. For ordinary work on haulage entries, the trolley, of course, will be used. At the dead ends of butt entries and other similar places where no trolley wire is available the cable will be employed, the reel being capable of carrying about 300 ft. of this conductor, thus enabling the machine to proceed this far beyond the end of the trolley line.

Making Coke from Non-Coking Coals by Froth Flotation

Non-Coking Coals Resist Coating and Flocculation but Sulphuric Acid Reduces Resistance and Good Coke Can Then Be Made

MANY types of coal either do not coke at all, or do not yield a product strong enough for metallurgical purposes, especially for use in high furnaces. In some cases it has been possible to produce, even from anthracite, a carbonized fuel resembling coke by mixing the material in a pulverized state with pitch and tar, and heating the mixture.

In investigations of a number of non-coking coals, by which is meant coal which does not ordinarily yield coke of the desired strength, it has been found that the surface of the coal particles is such that it resists coating with a binding medium. For example, tar or pitch, or a mixture of these two will not readily adhere to the coal particles and thus promote cohesion.

Wet processes for treating coal, such as the froth flotation concentration process and also various briquetting methods have been fully investigated, and in the course of these studies several non-coking coals have been encountered which, when suspended in water in a pulverized state and subjected to agitation and aeration with a liquid binding medium, do not become coated or flocculated. Such investigations have led to the view that if a non-coking coal can, by any means, be effectively coated and flocculated, a useful coke could be produced.

Three British engineers, Broadbridge, Edser and Beasley, have accordingly devised a process for producing a coke from such coals. This consists in suspending the powdered coal in water and subjecting the mixture to aeration and agitation with a liquefied binding medium, the coal particles becoming flocculated. The product is then briquetted and coked.

Certain coals naturally resist coating and flocculation, but if the surface of the pulverized non-coking coal is treated with a dilute solution of mineral acid, such as sulphuric, and with a liquefied binding agent,

such as tar or a mixture of pitch and tar, the particles will agglomerate and can be coked.

As a rule the acid is added to the circuit liquor itself so as to effect in one operation the treatment with acid and the coating of the particles.

In one process a powdered coal or a froth flotation concentrate is suspended in water and mineral acid of weight equal to 0.1 per cent of the weight of the coal is added. With this is mixed 7 per cent of tar. The mixture is agitated and aerated, and the particles agglomerate. From the agglomerate a good metallurgical coke is obtainable after briquetting to exclude water.

A coal slack obtained from one district in Britain could not be coked at all, and after purification by flotation and direct coking, the best coke obtainable had a strength of only 700 lb. per square inch.

When trying out the new process on this slack 1,200 gm. containing 20.7 per cent ash were crushed to pass a 5-mesh screen and the material was treated by froth flotation, the reagents used being 1 lb. of cresol and $\frac{1}{2}$ lb. paraffin per ton of slack. The treatment gave 802 g. of concentrate containing 7.5 per cent ash.

The concentrate, plus its own weight of water, was agitated in a froth-flotation cell equipped with an agitator which imparts a vigorous aeration. To it 2.4 lb. of sulphuric acid per ton of concentrate were added and tar to the extent of 7 per cent of the concentrate. The pulp was then heated by steam, and it was noticed that an intense flocculation occurred, the water being easily separable from the froth.

The flocculation was then pressed into briquets at a pressure of 2 tons per square inch, and the product made from it closely resembled a high-grade metallurgical coke, the density being 1.015, and the crushing strength 2,635 lb. per square inch. These results have been confirmed in large-scale tests.

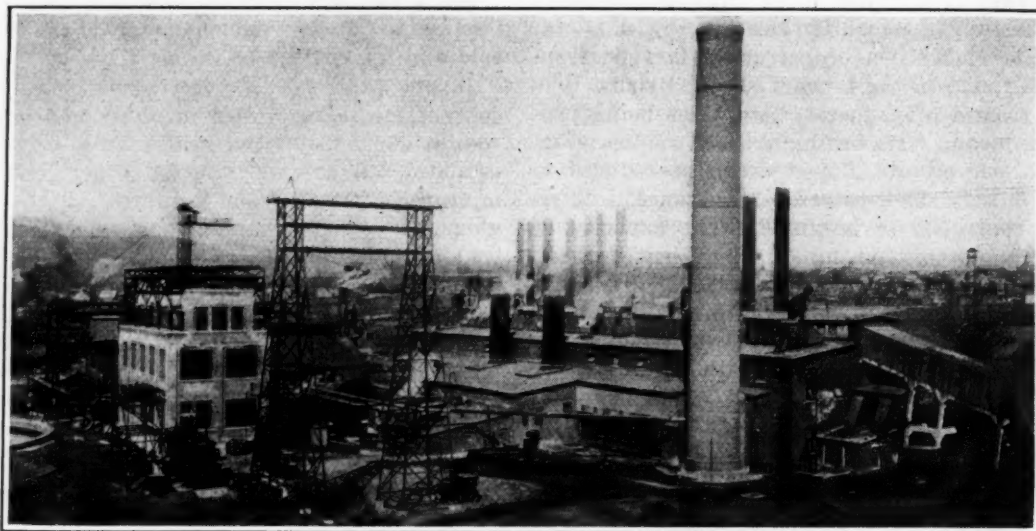
SAAR VALLEY COAL MAKES COKE

Another coal tested in this manner came from the Saar Valley (France) and consisted of a mixture of bright and dull coal together with carbonaceous shale. The ash content was 24.97 per cent, but was reduced by flotation to 9.12 per cent. This concentrate was screened to separate fines of a size to pass an aperture of 0.008 in. linear, and the fine portion was treated in an acid circuit containing 1 lb. of sulphuric acid per ton.

This fine coal was treated in a cell provided with an agitator, and the binding agent used consisted of 3 parts pitch to 2 parts tar in the proportion of 5 per cent binding medium to the total weight of fine and coarse coal. Steam was admitted and the temperature of the pulp raised to 90 deg. C. After the flocculation of the finer part of the coal, the coarse particles were added during agitation, and the whole material became coated and flocculated. The froth was then drained and briquetted at 2 lb. per square inch.

The briquets were coked in a silica pot which was heated in an electric furnace for two hours at a temperature rising gradually to 1,040 deg. C. The coke produced had a crushing strength of 2,430 lb. per square inch, and the results have subsequently been confirmed on a large scale in a coking oven.

The same concentrate flocculated in the same way but filtered and not briquetted yielded a coke having a crushing strength of 1,038 lb. per square inch. When the coal was neither flocculated nor briquetted the coke produced was not uniform, nor sufficiently homogeneous to justify any tests being made to prove its strength.



Hampton Power Plant

With Air Lift Flood Water Can Be Removed at a Single Inexpensive Setting of Equipment

Difficult Pumping Problems Solved by Use of Compressed Air—
Three Air Lifts Deliver 2,300 Gal. per Minute—Economy of Installation and Convenience of Operation Distinguishes the Air Lift

BY EDGAR J. GEALY
Associate Editor, *Coal Age*,
New York City

LAST MONTH when Herbert Axford, of the Ingersoll-Rand Co., presented his paper at the Scranton Engineers' Club on the operation of an air lift in the mines of the Glen Alden Coal Co., he revived interest in a water-raising system little used at most mines and almost forgotten at others. He showed how in spite of certain disadvantages the air lift can be used in emergencies and also that it can be utilized in cases where the water cannot be removed by a pump, because a pump cannot start the water on its way unless it can be placed near enough to the surface of the water to reduce the suction lift to manageable proportions.

There is nothing mysterious about an air lift. Years ago some of the men who installed them chased all observers away just before the plant at the well was put in operation. Consequently, many people thought some strange contraption or mystic word was necessary to get one in operation. A driller once asked a hydraulic engineer what kind of a fitting he was going to put at the end of the line used in an air lift, and when the engineer said he was going to use a reverse bend the driller thought the engineer was making fun of him. When the engineer finally said that he might not use any kind of fitting whatever, the driller thought he surely was demented.

NOTE—Mine water is used for condensing purposes at the Hampton power plant which is shown in the headpiece, consequently it was imperative to start the unwatering of the flooded areas at once. The reservoir and water hoist shaft are located just beyond the right-hand end of the boiler room.

The air lift operates on the principle that the solid column of water on the outside of the pipe outweighs the column of air and water on the inside and so lifts the water in that column to the surface.

In its use of energy the air lift is relatively inefficient. The ratio of foot-pounds of work done upon the water to the foot-pounds delivered to the electric motor which drives the compressor by which the air pressure is furnished, shows that under good conditions the efficiency of the device is about 40 per cent.

However, at times, the air lift is unusually efficacious when we consider the difficulties attending the use of other methods of raising water. For instance, it has the advantage that all the equipment may be located in any desirable place. Only the air line and discharge pipe need be located in the water. A pump must be set up not much more than 14 ft. above the surface of the water it is to raise; a compressor for an air lift may be located at any height above the water level.

Contrary to common belief the air in an air lift does not blow the water out of the discharge line. If it does in any particular case it indicates a waste of energy.

The outlet of the air line should be a considerable distance below the surface of the water to be raised. Within certain limits, the deeper the better. Considering the vertical distance from the nozzle of the air line to the discharge level of the water as unity, if the air line is 70 per cent submerged, the operating results are satisfactory. When the submergence is only 20 per cent the efficiency of the air lift is extremely low.

One of the most successful recent uses of an air lift was made by the Glen Alden Coal Co. at Scranton. On April 7 the Lackawanna River broke into the Taylor mine of this company. The territory flooded was part of a large drainage area handled by the Hampton pumping station.

FIVE BIG PUMPS SUBMERGED

The Hampton pumproom is located in the Clark bed which is above the Dunmore Nos. 1, 2 and 3 bed. In a short time after the river had broken in on the mine the water in the pumproom had risen 14 to 16 ft. above the floor level. The five large 5,000-gal. per minute pumps, each driven by a 1,000-hp. motor, were completely submerged. Only the Oxford and Holden pumps, located in adjacent mines at higher elevations, were left undisturbed. Normally the pumps at these last two mines are used to handle water collected at higher levels than the sump at the Hampton pumproom.

Liberal pumping capacity had been installed at the Hampton pumphouse, usually only one of the five big pumps were required continuously and one of the other pumps used 14 hr. per day. In spite of the large capacity of the station it could not stem the flood, and all the pumps were completely submerged.

PUT OLD WATER HOIST IN SERVICE

A 3,500-gal. per minute water hoist located on the surface at the Hampton plant was ordered dismantled a few weeks before the flood. Fortunately, this work had not been started, so after a few hasty repairs it was put in service. This hoist together with the Oxford and Holden pumps were the only important re-

maining pumping units left to handle the flood water.

The Hampton power plant, which is located on the surface near the pumping station, uses mine water for condensing purposes. About 10,500 kva. of generating capacity is in the plant,

and everything depends upon the supply of water from the mines. Consequently the Hampton power plant was in danger of being shut down and it was the water hoist which saved the day.

After the river water had been diverted from the cave hole which had opened into the Taylor mine, the water in the Dunmore Nos. 1, 2 and 3 beds began to lower slightly as it sought its level by flowing into the less accessible basins not previously filled. By April 10 the water in the Hampton pumproom had dropped 10 ft. and on April 12 the first motor was removed for repair. The next day the water was 40 in. above the pumproom floor, but the first pump was started, it being located at a higher level than the other pumps.

On April 30, the first air lift was installed to assist in unwatering the Dunmore beds. On May 2, another air lift was started and later a third was put in operation. The first two air lifts each discharged through 16-in. plain cast-iron pipes. Because much surface water entered the mine and greatly diluted the acidulous mine water, the use of this kind of pipe was successful. The air compressor which supplied the air for all three lifts was located on the surface and was connected to a large receiver which discharged into a 6-in. pipe line.

PUMPS RAISED WATER TO SURFACE

The water raised by the lifts was discharged into the Clark bed from which it ran into the Clark bed sump and was raised to the surface by the five centrifugal pumps which had previously been put back into service.

The discharge line was arranged as shown in Fig. 1. A T-connection was installed at the Clark bed level, and a short length of pipe was placed on the upper end of the T to act as a surge chamber. The end of the air line was located about 25 ft. above the Dunmore No. 3 bed, the lowest of the Dunmore seams.

On May 16, the third air lift was installed, but it discharged through a 12-in. pipe. This lift was put into operation because the compressor was sufficiently large to handle this extra load and thus speed up the unwatering process.

In the period extending from April 30 to Aug. 14, 1923, the water pumped by the pumps in the Clark bed was 1,200,000,000 gal. In the same period in 1924 when the air lifts were in operation, 1,860,000,000 gal. of water were discharged at the surface. From this it was estimated—assuming that the inflow during this period was the same both years—that the air lifts raised 660,000,000 gal. while in service. Records show that if the 12-in. line is considered about half the

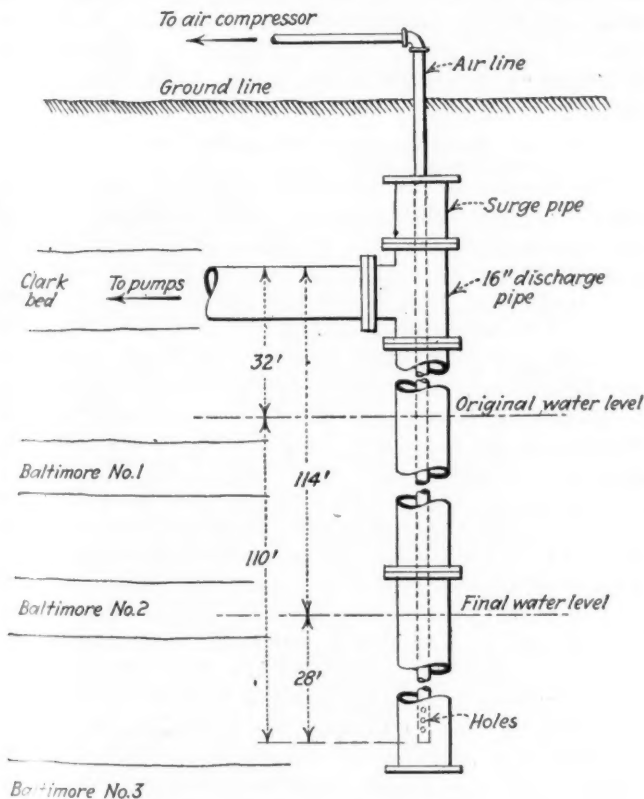
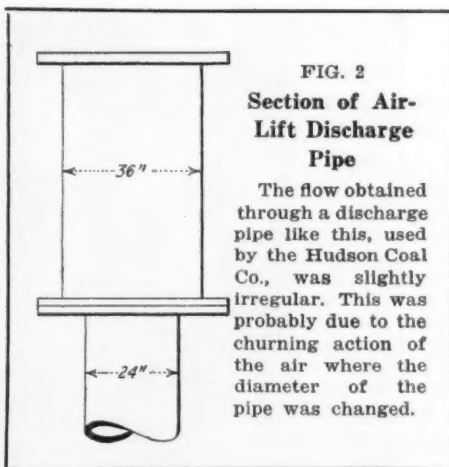


Fig. 1—Air Lift Unwaters Areas Far Below Pump Level

The air compressor was located on the surface and an air line dropped through the 16-in. discharge pipe. Water in the three Dunmore beds was delivered to the Clark bed pumps. Above the T-connection at the Clark bed were a few lengths of large pipe from which the air separated from the water could escape. Centrifugal pumps raised the water from the Clark bed to the surface. The efficiency of the air lift varied with the submergence from about 40 per cent to 20 per cent.

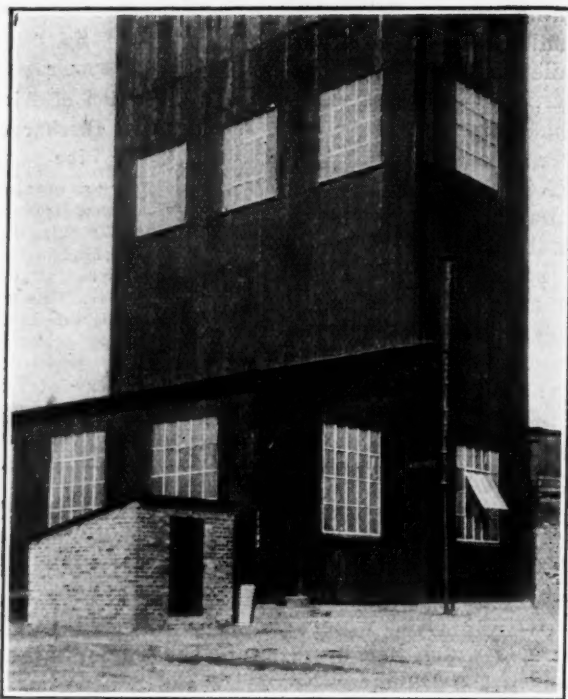


Fig. 3—Vertical Pumps Will Operate When Submerged

The tall building, part of which is shown in the illustration, is a Hudson Coal Co. pumphouse. It contains two large motors which drive two vertical-type centrifugal pumps located in the mines. There is no danger of losing the motors when the pumps are submerged, but the pumps must not be stopped when they are under water. The building is unusually high so that the shaft between a motor and pump can be raised for inspection or repair. Care must be taken that the couplings in the shaft are not loosened for, when the power is shut off, the returning water may drive the impeller as a water wheel and the pump will run backward.

capacity of one of the 16-in. lines the lifts were in service 4,650 air-lift-hours. From this figure it was estimated that the lifts discharged 2,360 gal. per minute. The initial submergence was 77 per cent and the final submergence about 20 per cent. The air pressure was about 45 lb.

Another interesting air-lift installation was made at one of the Hudson Coal Co.'s mines near Jermyn. Here a 24-in. pipe line was used in part of the discharge column and several 36-in. lengths of pipe used at the top.

AIR LIFT PROVES EFFICIENT

The Harleigh-Brookwood Coal Co. also recently used an air lift. Here a pump connected to a 14-in. discharge line had been submerged during the rainy season. The column line lay on a steep slope but nevertheless a 3-in. air line was inserted in the discharge pipe and a compressor put to work. Much to the surprise of the engineers the discharge was about 2,200 gal. per minute. The efficiency of the scheme was about 30 per cent. One of the workmen said it was more efficient than the old pump which was submerged.

A story is told of a master mechanic in a New Jersey iron mine combining the air-lift principle with a centrifugal pump. It is said he connected an air pipe into the column line of the pump and started both the pump and compressor. The result was that by this means he could raise the water 50 ft. higher than the pump was capable of doing alone. The conditions under which this was done are not entirely known, but it is understood that the presence of high water made the greater lift necessary. Some engineers are wondering whether such an arrangement is feasible and further investigations are being made.

Yampa Field May Provide West With Hard Coal

Anthracitization Varies Much in Any One Area—Ash Content Not Unduly High—Other Coals Are Bituminous And Subbituminous

The coals of the Yampa field, in Routt and Moffat counties, Colorado, are receiving more attention as progress is being made on the Moffat tunnel. The present steep grade over the Continental Divide of the Denver & Salt Lake R.R., the only line serving this field, is a serious handicap to the transportation of coal to Denver and the Great Plains region.

When the tunnel is completed one ordinary locomotive will haul twenty-two loaded coal cars over the divide in half the time that four Mallet engines now perform the same task. The great value of the tunnel to the coal industry can be made evident by pointing out that the tunnel will save 23 miles of line, 2,406 ft. of lift, and countless delays and blockades by snow and will reduce the gravity load on each coal car by one-half. In anticipation of the impetus to coal development that must follow the completion of the tunnel the coals of this field have recently been sampled by J. Brian Eby of the Geological Survey.

The analyses of the samples of anthracite from the Crawford tract show the variation in the rank of the so-called anthracite coals. In general, anthracite has a fuel ratio that ranges from 10 to 30. One sample, collected 125 ft. from the mouth of the mine, is a good anthracite, whereas another sample collected 95 ft. from the mine mouth is semi-anthracite. Three samples are good anthracite coals of over 12,000 B.t.u., but from the locality at which one was taken the coal rapidly decreases in rank toward the mouth of the mine, 260 ft. distant.

LOW-ASH BITUMINOUS COAL

The results of all analyses made of Yampa coals show that the sub-bituminous coals as mined contain an average of 19 per cent moisture, 32 per cent volatile matter, 45 per cent fixed carbon, and 4 per cent ash, and that they have a heating value of about 9,600 B.t.u. The bituminous coals average 9 per cent moisture, 47 per cent fixed carbon, and 5 per cent ash, and have a heating value of 11,600 B.t.u. The anthracite averages 6 per cent moisture, 6 per cent volatile matter, 78 per cent fixed carbon, and 10 per cent ash, and has a heating value of about 12,500 B.t.u.

Samples collected in the same tunnel, however, such as that on the Crawford tract, show that the coal does not hold its anthracitic character over any large area. This condition is due to the fact that the anthracite of this region was formed ages ago by the local alteration of beds of bituminous coal by the heat of adjacent masses of intruded rock. As the beds of anthracite are of uncertain extent, attempts to mine it should be preceded by careful prospecting and sampling, either by tunneling, shafting, or coredrilling. The rank and quantity of the Yampa coals are stated in Bulletins 297 and 748 of the U. S. Geological Survey.

ELECTRIC LAMPS are being introduced at the Rum Creek colliery of the Youngstown Sheet & Tube Co., Dehue, W. Va. This is the first mine in the Logan field to work with closed lights.

What Changes Should Be Made in Income Tax Laws

Rulings Should Not Be Revised Without Notice and Revision Should Never Be Retroactive—
All Rulings Should Be Published—Doubtful Items Should Not
Be Classed as Capital Expense

BY JOHN LAING

President, Kanawha Coal Operators Association,
Charleston, W. Va.

PERHAPS the taxpayer's most general objection to Federal income-tax legislation is that it leaves him uncertain as to his tax liability. Instances could be multiplied indefinitely of injustices by reason of that uncertainty. Of peculiar importance to the coal-mining industry is the fact that the Solicitor of Internal Revenue in a decision published Sept. 15, 1924, disallowed the deductions made by a coal company to cover coal cars, steel rails, and trolley wire which had been purchased solely because the length of haul had increased. The investment was necessary to maintain the normal output of the mine.

Deductions of this character were specifically allowed by Article 222 of Regulation 45, and by Article 222 of Regulation 62 if my construction of these latter regulations is correct. Many cases have been settled under these rules, and this recent memorandum of the Solicitor represents a complete reversal of the Department's policy, with the result that taxpayers in the future will not receive the same treatment as those in the past and may have many cases reopened which were considered closed.

This is not the only perplexity with regard to tax payments, for in the course of business transactions, parties are often prevented from making sales or entering into contracts for fear of the effect of the income-tax law. In consequence attorneys frequently are obliged to say in such cases that they cannot definitely advise clients as to the effect which such transactions will have upon their income taxes.

The Department refuses to advise parties authoritatively in advance as to what their tax liability will be. In legislation as complicated as the income-tax law, and as far-reaching in its scope, the element of uncertainty cannot be entirely eliminated. Two provisions, however, would greatly lessen this evil. They might be formulated thus:

(a) When the Department has once established a ruling allowing a deduction to the taxpayer, such ruling should not be changed, except so far as it may apply to future years. In other words, where taxpayers, under the rulings of the Department, proceed upon one theory of the law, they should have the advantage of that ruling until they are advised that the Department

has reversed its position, and this reversed position should be applicable only to taxes accruing subsequent thereto.

(b) An agency should be provided whose decision would be binding, to which taxpayers who contemplate entering into business transactions may submit for determination, questions of tax liability, so that the taxpayers may know in advance just how their acts will affect the taxes they will have to pay.

Unpublished Rulings—

An element contributing to the uncertainty in the administration of the income-tax law is the practice of the Department of promulgating, for the benefit of tax officials, rulings which are not made public. Attorneys and those practicing before the Department, frequently have the experience of meeting a ruling which has not been given to the public. It would be, of course, impossible and un-

desirable to publish every proceeding in the Department, but any ruling which is to be used as a precedent should be published so that it would be equally available to government officials and to representatives of the taxpayers.

Expense—Due to the complicated character of the income-tax law a tremendous expense is placed on the taxpayer. There are two important costs in all complicated income-tax cases—accounting and legal services—entailing upon the taxpayer the double burden of employing an expert accountant to arrive at the facts as disclosed by the books of the taxpayer and a lawyer, or tax expert, to present the legal effect of those facts when ascertained. This two-fold expense is imposed upon the taxpayer in addition to the tax. It would seem that this most burdensome element of the income-tax law is almost inherent and constitutes one of the most serious objections to the law itself.

Capital Items—The Department, under the indefinite language of the Act, has shown a disposition to classify all doubtful items as capital expenditures rather than as expenses, thereby depriving the taxpayer of deductions to which he is entitled. I have already noted the recent ruling whereby mine cars and the like, which were purchased by a coal company simply to maintain normal output, were disallowed as a deduction.

In one of the companies in which I and my associates

UNCERTAINTY is a leading characteristic in the administration of the Internal Revenue Office. Years are likely to elapse before a decision is rendered and then the case is apt to be reopened. Operators are asked to sign waivers under threat of an arbitrary assessment. This is practically a Departmental holdup, prolonging indefinitely the taxpayer's period of uncertainty as to his tax liability. Buyers are afraid to close deals not being assured as to the liabilities to which they are subjecting themselves. Uncertainty adds considerably to the cost and delay in the closing of tax cases.

are interested, the Department has disallowed as a deduction certain surveying expenses to which the company was put to settle its boundary line with an adjoining owner. This surveying was done long after the property was acquired, and the expenditure added nothing whatever to the productive value of the property, but the Department, nevertheless, has classified it as part of the cost of the land. Any item of expenditure which does not add to the productive value of the business should be classified as an expense, and the act should be so amended as to require the allowance of such deductions.

Delay—Section 1009 of the Revenue Act of 1924 provides that ordinary internal-revenue taxes shall be assessed within four years after such taxes have become due and no proceeding in court for the collection of such taxes shall be begun after the expiration of five years after the taxes have become due. This provision of itself permits great delay in the settlement of tax matters, and virtually all companies have several years' unadjusted tax liabilities hanging over them.

Though the period during which the government is allowed, under the act, to adjust taxes is unduly long, an even worse situation has developed because the Department frequently virtually requires taxpayers to sign waivers, under the threat, in effect, that if such waivers are not signed, there will be an arbitrary assessment.

As has been said by one writer on income-tax law, this is little better than a "departmental hold-up," and it has prolonged indefinitely, in many instances, the taxpayer's period of uncertainty as to his tax liability. Thus companies, as well as individuals, continually face an unadjusted and unascertained tax liability. This has had a most harmful effect upon the business of the country, particularly in two ways:

(a) Persons are afraid to buy the stock of a corporation for the reason that they will have no means of knowing what the unadjusted tax liability on the company will be.

(b) In many instances, some of which have come within my personal knowledge, the stock of a corporation changed hands through voluntary or involuntary sale. The new owners had no knowledge of the corporation's tax status, and later large additional assessments were made for taxes payable for years prior to the transfer of stock and these, in effect, fell on its new owners.

It would be perhaps impossible entirely to eliminate this condition, but the following are corrective suggestions:

(a) The period in which the government may collect back taxes should be greatly shortened, and, if necessary, additional employees in the Department be authorized, so that they could keep up with the work. I believe, however, that if the present facilities and help of the Department were applied with anything like the efficiency of a private enterprise, such additional employees would not be necessary.

(b) The Department should not be allowed to request

waivers from the taxpayers and should not be permitted to make a reassessment upon an arbitrary basis nor until after a thorough examination has been made.

In dealing with this matter I am treating more of the abuses under the old acts and these abuses may in part have been cured by the act of 1924, but I much doubt if this is so. Much depends upon the way in which the Department administers the new act.

Publicity of Return—Section 257 of the Revenue Act of 1924 provides that returns upon which the tax has been determined shall constitute public records and shall be open for inspection only upon order of the President and for the benefit of certain committees of the Senate or the House, certain officers of any state and a certain percentage of shareholders. This provision has been

much discussed and its injustice is apparent. It holds out the possibility, at least, of any business being made the subject of partisan and political scrutiny. The section further provides that a list containing the names of taxpayers, together with the income tax paid by them shall be made available to public inspection. Under this provision any competitor can ascertain year by year the income tax that is being paid by his rival, and through that knowledge he can easily de-

termine his competitor's net income. Many other abuses could be cited which would undoubtedly arise under this provision, not the least of which is that knowledge of every one's net income will be in the possession of anyone who has sufficient curiosity to look at the list and estimate the income from the tax paid.

This provision, which was inserted in the act of 1924 under the stress of political agitation, is, in my opinion, wholly bad and should be eliminated from the act. Its effect on the coal-mining industry would be particularly unfortunate in case of labor troubles or the attacks of demagogues. Knowledge of the income tax paid by various companies in a preceding year, with the resultant knowledge of what the net income was, would be a potent weapon in the hands of the enemies of the industry.

Net Loss—Section 206 of the act of 1924 provides that a net loss in the conduct of a business may be applied against income for the next two succeeding years. This step is an improvement over previous income-tax legislation. However, where the industry has a prolonged depression and where a company is in a formative period, two years is too short a period and should be extended.

Formality of adjustments—Section 1005 of the act of 1924 provides that there shall be only one inspection of the taxpayer's books, unless the taxpayer requests otherwise, or unless the commissioner, after investigation, notifies the taxpayer in writing that an additional inspection is necessary. In practice, even under the similar provision of the 1921 act, the Department has subjected the taxpayer to more than one examination. I have personal knowledge of this in some of the companies in which I am interested. This section should be amended so as to permit only one examination, unless

WHEN MINES are extended, mine cars, trolley wires and steel rails have to be purchased to maintain tonnage. Hitherto these have been listed as current expenses under the departmental rulings, yet a decision has been rendered recently classing these expenditures as additions to capital. This not only affects future tax payments, but puts in question past settlements adding to the grave uncertainties in which the whole question of taxes is at present involved. Mr. Laing in this article indicates what changes in the laws would assist in remedying fundamental injustices in the levying of income taxes.

the taxpayer requests otherwise, or unless there is reason to believe that the first examination has been rendered inadequate by reason of fraud or concealment on the part of the taxpayer.

The mere notice of the commissioner should not be sufficient to make an additional investigation permissible. This provision is virtually equivalent to permitting the Department itself to determine when it will do its work over again. Section 1006 provides that after a determination and assessment in any case, or acceptance of any abatement, credit or refund, "an agreement may be made in writing between the taxpayer and the commissioner, with the approval of the Secretary, that such determination shall be final." In practice it is comparatively difficult for the taxpayer to obtain the benefit of this section.

When such an agreement is requested the Department usually makes a re-examination of the taxpayer's books, even though they have been considered closed. Attorneys have the impression that the taxpayer runs a risk in asking for such an agreement. On the other hand, it is of the greatest importance to a taxpayer that he be assured within a reasonable time that his tax matters for any one year are closed and cannot be opened. This is particularly important where he is contemplating a

sale of his property and desires to assure the purchaser with respect to tax liability.

A provision should be added to the law that whenever the government sends out a 60-day notice (as provided in section 274 of the Act) advising taxpayers of a deficiency in tax, it be precluded from claiming any greater tax and that upon an adjustment between the unit and the taxpayer after such a notice, whether there is an appeal to the board or not, the tax matters for that year be automatically closed with no power in the Department to reopen them, except upon a showing of actual fraud or concealment upon the part of the taxpayer.

In other words, whenever there has been an adjustment for any one year between the taxpayer and the government, it should be considered final in the absence of fraud, even though no formal agreement has been signed. No injustice could be done the government, for the reason that it need make no financial adjustment until it has inspected the taxpayer's books. On the other hand, such provision, coupled with shortening the time in which the government shall have to collect taxes, would greatly shorten the period of uncertainty as to taxes for past years, which is now so great a burden to taxpayers.

High-Pressure Rock Dusting In Utah Coal Mines

Use Water Lines, Pack Mules and Sledges to Convey
Dust—Barriers Made Useless by
Absorption of Moisture

AT CASTLE GATE No. 2 mine the height of the roadways makes high-pressure dusting essential and a larger quantity of dust has to be used, than in a mine the roadways of which have a lesser perimeter. For this reason a 10x10-in. portable compressor giving a nozzle pressure of 70 lb. per square inch is used and about 3.5 lb. of rock dust is distributed per lineal foot. The limestone dust used is obtained from a cement company which pulverizes the material to a fineness suited to the manufacture of cement.

For reaching parts of the mine not equipped with electrical current, as well as to economize in the moving of the machine, the water lines are drained and blown out to free them of water and are then connected to the dusting machine. By this means dust has been delivered under sufficient pressure a distance of 3,600 ft. down a 12-per cent pitch, using the 3-in. water line already in place. Roadways also have been dusted successfully 7,200 ft. from the compressor using a 4-in. water line which lay up the slope from the compressor on a 6 per cent average grade. It is purposed to station a 12x12-in. compressor in the power house at Castle Gate No. 1 for this purpose. About the Sunnyside dusting plant, where the same pressure system has been used with a 10x10-in. portable compressor, the following information is available: The air pipe leading from the compressor to the injection nozzle is 1 in. and the pipe from the injector to the dust line is 1½ in., the nozzle itself being ¾ in. The pressure at the compressor is 80 lb., and the safety valve opens at 90 lb. At the injector nozzle the pressure is 70 lb. A 12-ft. length of 1½-in. pipe is used on the dust line. Where 20 ft. of pipe was employed the friction was excessive. Figuring 75 lb. of dust per sack, the machine throws dust

at the rate of 15 lb. per minute. From 35 to 50 sacks of dust are used every eight hours depending on conditions. This will cover 700 to 1,500 ft. of entry with an average of 838 ft. per shift.

WATER PIPES CONVEY DUST

At this mine also water pipes have been used successfully for dust distribution. On an average, 3.4 lb. of dust is used per lineal foot of entry, this figure includes the dust used in the crosscuts which are dusted as far back as the stoppings. Where difficulty was experienced in reaching points in untracked airways dust was conveyed on pack mules and sleds.

Cost of Dusting at Sunnyside, Utah

Application	
Labor	\$0.035 per lineal ft.
Material	0.017 per lineal ft.
Repairs	
Labor	0.007 per lineal ft.
Material	0.008 per lineal ft.
Total	\$0.067 per lineal ft.

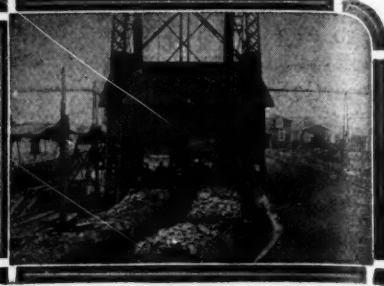
In the use of dust for the barriers in return airways the Utah Fuel Co. has found, says A. C. Watts, the chief engineer and geologist, that the unprotected dust will become so moist in three days' time that it can be balled up in the hand and that no dust cloud is raised when dust barriers are tripped. Even when the dust is covered with brattice cloth the result is the same.

Waxed paper, such as comes in powder boxes, was used for holding the dust. It prevented absorption of moisture for about 10 days. Dust was then placed in a cardboard detonator box with a tight lid. In two weeks the box was soggy with moisture and the dust on top would not form a dust cloud, but the dust in the center of the box was dry. With dust costing \$6.50 to \$7 per ton, the use of barriers in moist back entries becomes prohibitive.

NEVER HAVING entered a coal barony himself, John L. Lewis is without sin and therefore yearns to cast out the first Stone.



News Of the Industry



Need of Accurate Coal Output Figures Again Emphasized

Industry Frequently Forced to Do Business in Dark—Shortage in 1920
Greatly Exaggerated Because of Lack of Dependable Data—
"Phony" Statistics Worse Than None

By PAUL WOOTON

Washington Correspondent of *Coal Age*

The generally held opinion that it is imperative to have more coal statistics frequently has been reflected in this correspondence. Arguments for these statistics, when boiled down, are based on the inadvisability of attempting to do business in the dark. The classic illustration of the need for more good statistics is reference to 1920, when a real shortage of coal was exaggerated greatly in the public mind. Had it been known at that time after the critical period, which was ended in June, that stocks were increasing steadily, the frenzied buyers might have realized that the emergency had passed. As it was they did not know that stocks were increasing and the disturbance of the market continued for months. In fact it reached its peak in October, when stocks had climbed to the level of comfort.

The current issue of the *Purchasor*, the semi-monthly publication of the National Association of Purchasing Agents, furnishes an illustration of a different kind of danger—the danger of inaccurate statistics. Perhaps a better word would be "phony" statistics. Since late in 1922 the association periodical has carried a current survey of stocks and consumption of coal. The basis of the charts which are printed is not revealed. They are said to be constructed from returns from members of the association—a membership which represents a buying power of many million tons of coal annually.

Important Essential Missing

An examination of the charts indicates that the consumption which they purport to show sometimes runs as high as 48,000,000 tons a month, or in other words, practically the total consumption of coal. An essential of the statistics—the number of firms reporting—is omitted. On this point the association never has enlightened the public.

The possible harm that such ex-parte statistics can do is illustrated by the latest report which covers the month of October. It states that from Oct. 1 to Nov. 1 the stocks of industrial users increased 25,000,000 tons. The *Pur-*

chasor is so sure of its data that it can tell you the exact number of tons in stock. The more cautious Geological Survey and Census Bureau, in their statements based on written replies from more than 5,000 consumers, never dare to claim an accuracy closer than two or three million tons, but the *Purchasor* has it figured down to the last ton. On Oct. 1 stocks are declared to be 52,468,725 net tons and on Nov. 1 they are shown to be 77,754,068 net tons. In other words, in the brief space of thirty-one days there went into storage exactly 25,285,343 tons.

Discrepancy Evident

The coal trade was not aware of its extraordinary performance in October. The *Purchasor* tells the producers that they have mined coal enough in one month to put 25,000,000 tons into storage, besides meeting the current consumption. It is true that when the coal man looks at the *Purchasor's* chart he is bound to be puzzled in figuring out how this could be because the total tonnage produced, according to the *Purchasor*, was only 55,000,000 tons, while the industries themselves (not including "coal consumed for industrial heating and consumed by the householder") used about 35,000,000 tons. Such a discrepancy seems not to worry the *Purchasor*. An advance proof of the statistical article was sent to the National Coal Association. It was hurried back with the discrepancies noted. This communication was acknowledged with the statement that corrected proofs were being forwarded. The corrected proofs were not received and the *Purchasor* was printed with the original material unchanged.

There is no inclination to question the good faith of the purchasing agents or their fuel committee. It must be admitted that they have had reason to complain against the service they have been given by the coal industry on occasions. But there is no getting around the fact that the circulation of much claims of sudden enormous additions to stocks have a most injurious effect on the coal operator. Prices already are below a living level.

There was an addition to stocks in

What Illinois Miners Earn

Those Illinois miners who worked during October averaged a weekly pay of \$36.17 and in November, \$29.78, according to the monthly report of the state Department of Labor. The same number of names appeared on the various mining company payrolls during both months. The average earnings of the miners thus dropped 10.6 per cent. The reported running time of the state dropped only 2 per cent from 49.4 per cent of full running time in October to 47.4 per cent in November. Therefore it could be deduced that Illinois miners fortunate enough to have work are still able to buy gasoline for their motor cars. But the fact that several mines with big payrolls have worked almost continuously during those two months indicates that a considerable share of the total wages of the state have gone to a comparatively few men. The rest are in the same condition as the union miners in most other parts of the land.

October. A brief study of the official data on production in the last stock report of the Geological Survey and the Bureau of the Census shows that the addition could not have been 25,000,000 tons. It is entirely obvious that stocks were augmented by much less than 5,000,000 tons. The claim to 25,000,000 tons is preposterous. It would mean an addition to stocks such as never have taken place before, even in periods of frenzied buying before a strike.

The feeling at the National Coal Association is that the producers have a right to protest against any such rigging of the coal market to the advantage of the buyer. Producers and consumers of coal alike are agreed that the trade needs figures on stocks more than any others, but it is regarded as obvious that these figures should be compiled and published by a neutral agency that could have no interest in doctoring the results.

In the Dec. 4 issue of *Coal Age* the National Association of Purchasing Agents stated that the amount of hard and soft coal in storage in the bins of users in the United States and Canada as of Nov. 1 was 77,754,068 net tons, an increase of 25,285,343 tons over Oct. 1. These figures should be corrected to read 57,754,068 tons and 5,285,343 tons respectively.

Spread of Central Heating Foreseen in Canada

Central and district heating, having shown economies, probably will be adopted to an increasing extent in Canada, according to a report by the Dominion Fuel Board following a recent investigation. In addition to the saving effected by the substitution of low-grade fuels and refuse, other advantages are the elimination of smoke, dust and dirt, reduced fire risk, ease of regulation, uniformity of temperature, relief of street traffic from coal and ash haulage and appreciation in value of property.

One of the essentials to success in district heating, the report points out, is density of load, and for this reason it cannot be successfully adopted in towns of less than 4,000 population, and if other conditions are not favorable, the minimum population for economic operation is 10,000.

The cost of service can be lessened sometimes by combining the heating plant with a steam electric generating or an industrial plant. Even in the most efficient steam engines and steam turbine generators only 15 per cent of heat in the steam is utilized for heating. At the district heating plant at North Battleford, Saskatchewan, for instance, exhaust steam from the municipally-owned steam electric generating system is used for heating.

The benefits to be derived by consumers, the report states, are not so much in cost as in increased convenience, cleanliness and relief from handling ashes. A great deal depends, it is pointed out, on the cost of fuel available, but under ordinary conditions it has been generally established that to give the heating company a reasonable return a rate must be charged for dwellings in excess of the cost of fuel for individual heating.

Among the interesting facts brought out by the inquiry is the fact that despite its hydro-electric power development the province of Ontario consumes 60 per cent of the coal requirements of the whole Dominion. Another curious fact is that in spite of the difference in temperature coal consumption for heating buildings in Canada is slightly less than in the northern United States. In

Coal Review Discontinued

Coal Review, published weekly for several years by the National Coal Association, will be discontinued after the issue of Dec. 24, 1924, and in its stead Saturday bulletins direct to the membership of the association will be resumed and news releases for Tuesdays, covering statistical, traffic and other information of the association, will be prepared for coal trade and other papers, according to announcement by Harry L. Gandy, executive secretary of the association. A monthly résumé of news will be furnished to monthly trade papers.

"*Coal Review* was established in March, 1920," says Mr. Gandy, "when there was urgent need for the publication of such a magazine by the National Coal Association. Conditions have changed, however, and, that need having passed, the executive committee decided the field would be thoroughly served by the other coal trade publications. This change of association policy, it is believed, will result in a more intimate contact between the Washington office and the membership, and in an increasingly helpful and friendly relationship between the association and the various trade and other papers."

"C. B. Huntress, associate editor of *Coal Review*, will be director of information service for the association and will be available to trade and other publications not only in respect to the weekly news release but for special articles and the covering of special events. The program of the association contemplates a wide range of information service concerning the bituminous coal industry."

fact in the heating of dwellings it is appreciably less. This, it is stated, is due to better building construction and the use of double windows in Canada; to the greater use of hot water radiation and to the fact that Canadians are used to lower indoor temperatures than are people of the northern states.

British Coal Industry Prosperous in 1923, Due Mainly to Ruhr Upset

Owing mainly to the dislocation of production from the Ruhr coal field, 1923 was a prosperous year for the British coal mining industry, states the third annual report of the British Secretary of Mines, recently issued. Output was higher than in any previous year, except 1913; exports surpassed even that "record" year; prices were good and earnings improved on the low level of the preceding year. Output in 1923 totaled 276,000,000 tons, compared with 249,666,666 tons in 1922 and 287,500,000 tons in 1913.

Employment during 1923 was good. At the beginning of the year only 4.5 per cent of the insured coal miners were unemployed, and at the end the number had fallen to 2.4 per cent. This decline was reflected in the increased number of wage earners on colliery books. At the end of 1922 they numbered 1,129,539, and a year later they totaled 1,184,786. Coal was wound at the pits on 277 days on the average, or 15 more than in 1922.

Home Consumption Drops

The prosperity of the export trade last year was chiefly attributable to the occupation of the Ruhr. Seventy-eight million tons of coal (excluding 1,485,000 tons shipped to Irish Free State ports during April to December) and 4,000,000 tons of coke were exported during the year, as compared with 73,500,000 tons of coal and 1,250,000 tons of coke exported in 1913, which was the highest level previously recorded. The British home consumption of coal was less by 15,000,000 tons than in 1913, although the quantity available was 11,000,000 tons more than in 1922.

In a long comparison of the results of the operation of the national wage agreement between the years 1922 and 1923 the report shows that though there was an improvement last year in both the gross proceeds per ton and in "costs other than wages," the average increase in the actual wages paid was only about 2d. per ton, or 1d. per shift.

West Virginia Coal Mining Institute

With its spirits unruffled by the heavy technical diet which the program committee had provided. However, it must be remembered that this was taken at "recess" when spirits bowed down by rock dust, pneumatic separation and electrification of gaseous mines were let loose to contemplate less serious matters.



Coal Output in Canada Up In September, but Still Behind 5-Year Average

Output of coal from Canada mines during September, 1924, according to a report by the Dominion Bureau of Statistics, amounted to 902,595 net tons, an increase of 28 per cent over the tonnage for the previous month, but 35 per cent below the average for the month for the past five years. The greatest increase was 132,000 tons in Alberta to a total of 265,000 tons for the month. The remaining provinces in order of their gains in output were Nova Scotia, up 66,000 tons to a total of 471,000 tons; New Brunswick, 6,000 tons increase to 18,000 tons in all, and Saskatchewan, 1,000 tons more with 17,000 tons output. British Columbia's output declined from 137,000 tons to 132,000 tons.

Comparison of September and August figures covering the total importation of coal from the United States and Great Britain shows an increase of 1 per cent. September imports amounted to 1,587,613 tons while in August 1,557,141 tons was brought in. The September importations this year were 11 per cent lower than the five-year average for the month. During the month 13,620 tons was imported from Great Britain. Total importation of coal for the nine months of 1924 was 12,165,436 tons, or only 7 per cent below the preceding five-year average for the period.

The imports of anthracite for September totalled 327,949 tons. This was slightly less than in August, and about 1 per cent less than the five-year average for the month. Anthracite imported from the United States amounted to 314,329 tons, while 13,620 tons came from Great Britain. The total amount of anthracite imported during the nine months of 1924 was 2,969,224 tons, a decrease of 8 per cent from the five-year average for this period.

The exports of Canadian coal for September were 13 per cent lower than in August. The quantities were: September, 55,353 tons, and August, 63,415 tons. Comparison of the September exports with the preceding five-year average showed a decrease of about 67 per cent. Exports from the eastern provinces amounted to 35,297 tons, an

New Stunt in Canada

The formation by a vote of 290 to 10 on Dec. 7 of a British Columbia miners' association by Crows Nest Pass Coal Co. men who quit the union represents an interesting experiment. The agreement between the men and the company, reported in *Coal Age* last week, calls for a wage 55 per cent above 1914 scale and slightly above that now paid on Vancouver Island. This means about \$5.20 per day. Contract men are expected to earn about \$8 a day. The new contract runs four years but the company agrees to increase wages if business justifies it. The company's mines have all been shut down because of lack of trade.

This Union State Increased Its Coal Output

Arkansas produced 204,240 tons more of coal during the fiscal year ending last June 30 than it yielded the previous year, according to the report of Jesse Redyard, state mine inspector. The 192 mines of the state, of which only 80 were active, raised a total output of 1,298,791 tons. Of the inactive mines 63 were idle and 49 abandoned. Of the total, 101 are slopes, 44 are shafts, 16 are strip pits and 1 is a drift mine. The underground mines are ventilated thus: 78 by exhaust fans, 31 by furnaces and 53 by natural ventilation. Men employed totaled 3,597, 95 of whom were hurt during the year. The production per fatality was 593,896 tons and per non-fatal accident, 12,503 tons.

Seek Greater Safety in Hard Coal Mines

Mine inspectors, representatives of the coal companies and representatives of the mine workers of the anthracite field will meet in Wilkes-Barre, Pa., on Feb. 24, 1925, for the purpose of discussing various methods of preventing and reducing fatalities and accidents in the hard coal mines. Officials of districts 1, 7 and 9 of the United Mine Workers will be invited to the meeting. A detailed program relating to subjects of importance to all engaged in the mining industry is being arranged. Among the papers to be read are "Falls of Roof," "Accidents from Mine Cars," "Premature Blasts," "Exploding Gas" and "Mine Fires." Several speakers of national repute will address the meeting. The meeting is being arranged under the auspices of the National Safety Associations. S. D. Wariner will secure the representatives of the operators.

Confirm Meyer and Campbell

The Senate on Dec. 10 confirmed the nominations of Commissioners B. H. Meyer and J. B. Campbell, whose names had been sent by President Coolidge for reappointment as members of the Interstate Commerce Commission. Their present terms expire Dec. 31.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of November

(In Net Tons)

Ports	Railroads	1924			1923			1922		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hooking Valley.....	6,531,303	194,032	6,725,335	5,003,169	150,612	5,153,781	3,195,480	91,530	3,287,010
	Big Four.....	57,298	138	57,436						
	N. Y. C.-Ohio Central Lines.....	135,399	5,090	140,489	1,179,147	36,815	1,215,962	848,157	27,141	875,298
Sandusky.....	Baltimore & Ohio.....	2,154,306	66,808	2,221,114	2,861,500	83,889	2,945,389	2,814,496	75,895	2,890,391
	Pennsylvania.....	4,152,278	125,120	4,277,398	3,005,405	95,418	3,100,823	2,695,899	97,303	2,793,202
Huron.....	Wheeling & Lake Erie.....	790,494	36,264	826,758	1,471,905	58,169	1,530,074	413,682	16,753	430,435
Lorain.....	Baltimore & Ohio.....	2,218,245	158,610	2,376,855	3,643,163	194,893	3,838,056	1,798,619	90,969	1,889,588
Cleveland.....	Pennsylvania.....	1,412,762	175,782	1,588,544	1,850,573	198,975	2,049,548	1,024,802	91,394	1,116,196
	Erie.....	327,720	11,336	339,056	739,025	31,920	770,945	381,903	14,208	396,111
Fairport.....	Baltimore & Ohio.....	550,702	84,394	635,096	880,389	80,118	960,507			
Ashtabula.....	New York Central.....	868,915	112,296	981,211	3,322,902	253,537	3,576,439	1,472,339	86,792	1,559,131
Conneaut.....	Pennsylvania.....	1,183,630	78,463	1,262,093	2,083,379	91,037	2,174,416	1,623,878	88,638	1,712,516
	Bessemer & Lake Erie.....	1,502,672	196,727	1,699,399	2,781,553	240,553	3,022,106	1,546,725	61,850	1,608,575
Erie.....	Pennsylvania.....	684,669	85,802	770,471	717,240	93,489	810,729	198,110	70,383	268,493
Total.....		22,570,393	1,330,862	23,901,255	29,539,350	1,609,425	31,148,775	18,014,090	812,856	18,826,946
*1923 Storage Loading.....		182,060	4,940	187,000						

* Coal loaded into vessels in December, 1923, after close of navigation and forwarded from Lake Erie Ports during 1924 season of navigation.

† Lake coal into Toledo over Big Four Route and dumped by Ohio Central machine.

‡ Includes 2,578 tons amalgam coal.

Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.

Bain's Annual Report Outlines Year's Work Of Bureau of Mines

Accidents in the coal mines of the United States, with their consequent train of deaths, injuries, and tremendous property losses, continue to be too frequent despite the results of modern research which have demonstrated clearly the principal causes and definite means of minimization of such accidents, Director H. Foster Bain of the Bureau of Mines points out in his annual report to the Secretary of the Interior.

For the 13 years 1911 to 1923, inclusive, the Bureau's records show 23,822 lives lost through all classes of accidents at bituminous mines in the United States. Explosions of gas and coal dust caused 3,185 deaths, or 13 per cent of the total. Most of the larger explosions were propagated through the mine workings by coal dust chiefly and therefore coal dust was responsible for the greater part of the loss of life. This extension of an explosion throughout a mine can be stopped even if all initial explosions are not prevented.

Despite the general good will of miners, mine operators, state inspectors and manufacturers of explosives and machinery the tested recommendations of the Bureau have not been adopted in the mines as rapidly or as broadly as is necessary if the loss of lives is to be stopped, the report declares. Consequently, although there has been real progress, as in the decreased loss of life due to accidents from explosives, the death rate from gas and dust explosions is now as great as ever. One state, Utah, following a mine disaster that caused the loss of 171 lives, has adopted every practical tested method of preventing or limiting gas and dust explosions, and is having these methods introduced in the mines as rapidly as possible. An active campaign of field demonstrations is necessary to bring home to those in other states the danger that has become so familiar as to be frequently overlooked and to show that effective precautionary methods are known and available.

The dominant features of the Bureau's efforts during the year to increase safety in mining have been the development of international co-operation with the Mines Department of Great Britain for research looking to the reduction of mine accidents; an intensive campaign for the adoption of rock dusting as a preventive of disastrous explosions in bituminous coal mines and an extensive study relative to the safe use of electricity in coal mines.

The Bureau of Mines considers that had the coal mines of the country in past years followed the principle of rock dusting the mines as a means of preventing the spread of explosions many large mine disasters would not have occurred and hundreds of lives could have been saved. In view of the large number of deaths from explosions during and since 1922 the Bureau urges that the practice of rock dusting be adopted as soon as practicable in all bituminous mines in which dust constitutes a hazard.

Ever since its establishment the Bureau has strongly urged the use of

Bed of Dried Up Waterway Proves Coal Mine

Although the prolonged period of dry weather has helped the coal business in some localities it has proved the opposite in certain sections of New Jersey near the abandoned Morris Canal.

Persons living along it at Hackensack and Port Murray made the discovery recently that the dry bed of the waterway contains tons of coal which dropped from passing barges in the years that mules towed craft down the canal. At some places boats must have overturned, for mounds of coal have been found.

News of the discovery spread rapidly, for scores of persons, some from as far away as ten miles, quickly began gathering up coal.

"permissible" explosives in all coal mines where there is any hazard from gas and dust, and the amount of "permissibles" used has steadily increased. However, while this increase has been steady, the replacement of other explosives by "permissibles" has not been as rapid as it should be, in view of the known effectiveness and greater security of "permissibles."

During the fiscal year the Bureau studied the possibilities of radio as a means of establishing communication between miners trapped underground following mine fires and explosions and rescue parties on the surface. The results give some promise of the possible development of a satisfactory system of communication through what is known as line-radio, which utilizes metal piping, wiring, car tracks and other permanent metal equipment as carriers for the voice.

A lignite carbonizer recently designed by the Bureau after extensive investigations should, it is believed, result in the ultimate solution of the tremendously important problem of economic utilization of the lignites of the Northwest. These lignites comprise nearly one-third of the total solid fuel resources of the United States.

State Mine Inspector Wants Colorado Made Safer

A new coal mining safety code for Colorado is embodied in a bill which James Dalrymple, state mine inspector, has prepared for the next session of the Legislature. It follows along the lines laid down in the strict Utah state mining code adopted in that state after the Castlegate mine blast. Mr. Dalrymple would insist upon rock dusting and adequate sprinkling and would make a number of other safety practices compulsory. Incidentally he wants his own office and staff placed under civil-service regulations.

The suggested legislation would require that superintendents be held equally responsible with mine foreman for safe conditions underground; that all mine officials pass periodic examinations for competence; that coal-cutting and coal-loading machines be equipped with water lines to reduce dust; that open-flame lamps be barred; that every man entering a mine shall be searched for "intoxicating liquors, matches, pipes, cigars, cigarettes or any device for making lights or fire not authorized or approved"; that all shotfirers be certified, that they must always test for gas and never fire a shot in an atmosphere where gas can be detected by a safety lamp; that no explosives be used except permissibles and the quantity per shot be limited and that all shot-holes be tamped to the mouth with clay or other incombustible.

Dusting or Sprinkling Required

Rock dusting would be required from mine openings to room necks, on all haulageways, aircourses and active entries, with dust barriers at strategic places. The law would give the inspector power to shut down any mine which did not keep its dust in the mine up to the required safety proportion. But it would be permissible for mines which did not rock dust to maintain safety by sprinkling liberally throughout a mine so that its coal dust should at all times contain at least 30 per cent water by volume.



Special Man Trip at Gary No. 6 Mines

This trip with cars covered with white duck for the occasion took the members of the West Virginia Coal Mining Institute into the mines to see the O'Toole cutting and loading machine.

Equal Opportunity for All in Business Is Aim of O. D. Young, Says Hoover

More than 1,000 leading men in all fields of endeavor accorded a remarkable tribute to Owen D. Young, co-author and first administrator of the Dawes plan, at a dinner in the Waldorf-Astoria, New York City, Dec. 11. Among those who lauded Mr. Young for his part in the economic reconstruction of Europe was Herbert Hoover, Secretary of Commerce, who spoke as follows:

"The German reparations had become one of the world's most dangerous inheritances from the war. The sequent failures in its adjustment had poured an increasing stream of conflict into international life, carrying with it political jeopardy and economic demoralization with its train of millions of unemployed and suffering.

"The accomplishment of its settlement involved great economic questions of production and distribution, of currency, of credit, of taxes, and of exchange. Solution has been found in denominations of money and goods, in the creation of complex agencies of finance and government. But there springs from the settlement something far greater than the denomination of these quantities and the working of this machinery of government. It has turned millions of men from discouragement to hope. It has revived the forces of courage and enterprise. It has done even more. It has defeated the forces of hate, and advanced the tide of peace in the hearts of men.

Adjustment Is Far Reaching

"While this adjustment primarily advances the welfare of the nations of Europe, it reaches far afield in the world. Unemployment and suppressed production anywhere in the world are in the long view a world loss. This restoration of confidence and hope and enterprise, this restoration of commerce, of productivity, and of employment, this relief of suffering in a great nation, is a world asset. As a people we also participate in its blessings. Some part of our growing demand for labor, some part of the increased prices already realized by our sorely distressed agriculture, have come from this restoration of economic vigor and hope in Europe. It is a great thing to have contributed so much to this achievement.

"The wounds to our complex and intricate civilization from the war were so deep and so vital that many had despaired lest statesmanship would be unequal to their healing. Six years since the armistice seems a long time to those who live it and partake of its anxieties. Six years is a trifle in human history, and yet within it, one by one, these great problems of reconstruction have been solved. Surely in this new accomplishment for which we justly give tribute tonight we see again renewed confidence, hope and faith in human institutions. There are indeed many problems yet unsolved, but none of those before us are as dangerous to the restoration of civilization as those

that have already been successfully met in these six years.

"Some have doubted whether the enormous liabilities established under this settlement can be discharged. There are those who have contended that no great external contributions from one nation to another can be economically sustained. Without debating this question I may be permitted to offer one thought in this connection. The payments provided in such settlements must find their substance from production and economic services rendered. These international obligations are huge burdens, but in the course of years any burden shrinks in weight in proportion as the productivity of a nation grows. When the world keeps peace it doubles its international trade once in nearly every score of years.

"The processes of industry and commerce are the cells which heal the injuries of the economic world. They cannot multiply in the noxious air of conflict and political uncertainty. The settlement to which our guest has contributed so much clears the atmosphere, and the magical multiplication of these cells will quickly provide the strength to meet the burdens—if the world keeps the peace.

"But beyond even these special occasions of vivid public service, Mr. Young has made a still further contribution to American life—perhaps the greatest of all his contributions. That is in his display of the fine sense of the responsibility which today rests upon those who administer our largest industries.

Would Preserve Initiative

"Manufacture and distribution on a vast scale is the foundation of our high standard of living and the general comfort of our people. It can be accomplished in no other way than through the development of great units of production. With their development have come innumerable problems of public relationship and public responsibility. We are in fact today witnessing a rapid evolution and perhaps a silent revolution in the relationship of great business to our social system. We are struggling to preserve the fundamental stimulus of action, of initiative and competition, to hold open the avenues of opportunity. At the same time we are struggling to gain the benefits of co-operative action.

"In this period of evolution nothing is more needed than clear vision of their public responsibilities on the part of our industrial leaders. For here is a triple trusteeship—a trusteeship to the owners who ultimately must be comprised from the savings of those who endeavor to provide security for their dependents and for their old age. These must have proper stimulative return as a reward for their enterprise and their self-denial. There is the trusteeship for a vast body of employees that they should have stability in employment and a sense of security for work conscientiously performed, that they should have a growing standard of living and comfort, and full

Postponed Again

Secretary McGinty of the Interstate Commerce Commission announced last week that the commission has decided to postpone further the effective date in the so-called assigned coal car case—Docket 12530. The order, which was to have become effective Dec. 15, has now been deferred until Jan. 15, 1925.

opportunities for recreation and education.

"There is an equal trusteeship to the whole public who are served by the products of these enterprises. It is in the public interest that the product should be multiplied; should be given with every advantage of technical excellence and service and upon the best terms which can be attained with due regard to the two other strong obligations toward which our leaders must also look. This trusteeship goes even further. Constant gains to each group depend upon the elimination of waste and the constant development of science and invention, of increasingly more efficient organization. Beyond this again these organizations must be held high in the business and ethical relations by the character of their leaders. They must be conducted in a fine sense of non-interference with human rights.

"I know of no responsibility larger than that imposed upon the headship of great industries, for from their leadership and their vision must come not only great contributions to our economic progress but upon it depend the solution of the many social problems which confront us. We have a real and growing measure of this sense throughout American industry. And Mr. Young has been the expression of this type of leadership.

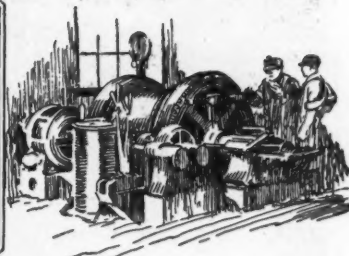
"There is one final thought to which I should like to give expression. Our friend and his colleagues in entering upon this mission to Europe, and in contributing so much to its high accomplishment, occupied the unique position of private citizens. Mr. Young is honored tonight as a private citizen. Does this not illuminate the potency and possibilities of private citizenship in a real democracy? Here is a world service of sublime accomplishment rendered by individuals bearing none of the trappings of public office but who nevertheless were accepted as the representatives of the intelligence and instinct, good will and faith of the American people—and represented it to the pride of their countrymen."

New Haven R.R. Opens Bids

Bids opened Dec. 15 by the New York, New Haven & Hartford R.R. for 360,000 to 410,000 gross tons of high-volatile run of mine bituminous coal, to be delivered in substantially equal monthly quantities between May 1, 1925, and May 1, 1926, disclosed twenty-one tenders from twelve bidders. The quotations ranged from \$4.80 to \$5.50 per gross ton alongside, Boston. This is the second set of bids submitted, the first batch, opened Nov. 17, having been rejected.



Practical Pointers For Electrical And Mechanical Men



By Large Mandrels Old Locomotive Motor Frames Are Made Like New

**Pittsburgh Coal Co. Brings All Worn Equipment up to Standard—
Uses Mandrels to Fit All Types of Motors—Large
Stock of Repaired Parts on Hand**

EVERY MINE electrician or mechanic concerned with the upkeep of old equipment knows the difficulties which arise when the motor cases of mine locomotive motors become worn so that the bearing housings and axle brasses do not fit properly. Such difficulties as arise can be overcome by the use of over-sized parts, however this is highly unsatisfactory because most of these over-sized parts are more expensive and their use complicates the economical and expedient handling of repair work.

Even though a mining company has a lathe or boring mill large enough to accommodate a motor field frame it is difficult and time-consuming to set up the frame properly so that the machining will be true. The Pittsburgh Coal Co. makes a practice of building all worn equipment up to standard and also has solved many of the difficulties of chucking. Mandrels to fit the various types of motors have been provided.

FIVE MANDRELS USED

Fig. 3 shows one of the five mandrels used at the company's central shop at Library, Pa. By the use of shoes or liners one mandrel may be adapted to several sizes. The stock of five mandrels and several sets of shoes takes

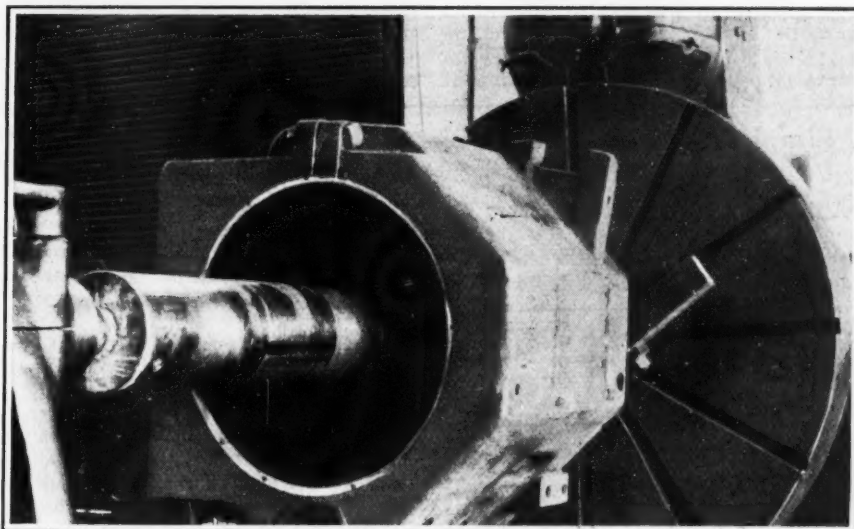


Fig. 2—Motor Frame Set Up in the Lathe Ready for Work

The use of the mandrel on which a locomotive motor frame is clamped reduces the work of setting up the frame in the lathe to a fraction of that necessary were it to be chucked, and makes it easy to center the piece. The end of the frame has been bored ready for a ring bushing. The bushing is then bored to factory standard.

care of all the sizes of locomotive motors that the company uses.

A large motor field frame clamped on to a mandrel and swung in a lathe

being fastened in place by electric welding. This process requires that the frame be machined twice, once to bore out the worn part ready for the bushing and again to bore out the bushing to true center. This same procedure is followed in repairing worn axle boxes so that the standard size brasses can be used, but in this case the machining is done by a jig, in a horizontal boring mill. In the background of Fig. 1, can be seen on the ends of two motor cases, how the bushings are welded in place.

MANY MOTORS REPAIRED

An idea of the extent of this kind of work which is being done in the Library shops may be gained from the photograph, Fig. 1. This is only part of a group of locomotive motors which have been repaired and have been placed in the stock room adjacent to the shop. Albert Hasson, shop superintendent, explained that these motor cases are complete with field coils, and as all parts are standard, they can be sent on short notice to any of the mines in exchange for frames which have given trouble and are to be sent to the shop for repair.

Such work as this cannot be done

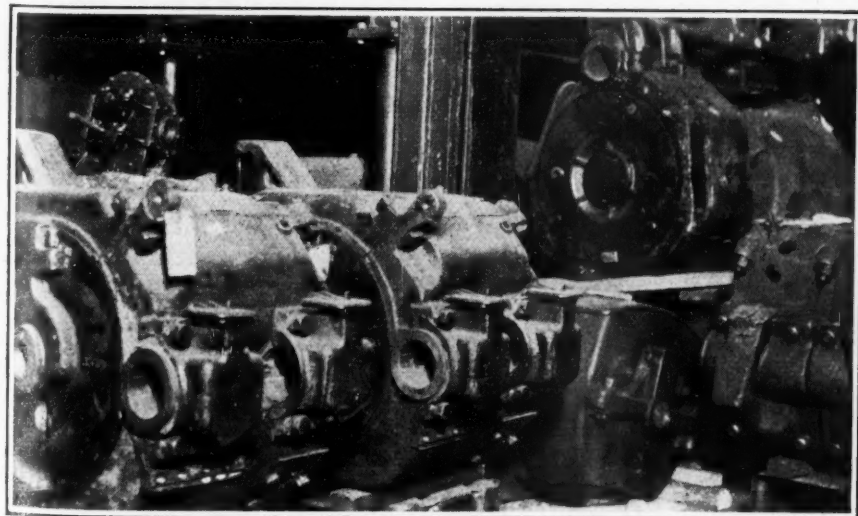


Fig. 1—Part of the Group of Spare Motors in the Storeroom

When the motor of a mine locomotive gets into bad condition a repaired motor is sent out from the shop and the damaged one returned for repairs. After the motor is overhauled and any badly worn parts built up to standard, this motor goes into stock.

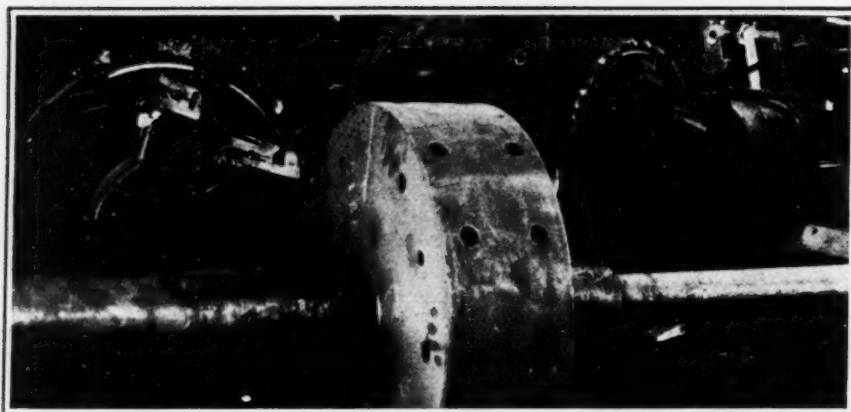


Fig. 3—Mandrel Used for Swinging Motor Case in Lathe

In the foreground is one of the five mandrels used in the central repair shop of the Pittsburgh Coal Co., Library, Pa. Just back of the mandrel can be seen the ends of two motor field frames which have been repaired. A large ring bushing has been inserted and fastened by electric welding.

economically anywhere else than at or near the mines; the cost of handling and shipping motor frames to distant points is prohibitive. Just as soon as

other companies start this kind of repair service for their electric equipment they will begin to reduce the number of armature burnouts.

Simple Shear and Bender For Chute Plates

A handy little tool used about the shop is the combination punch and shear pictured in Fig. 1. The stand is a home-made affair. Some pipe, some

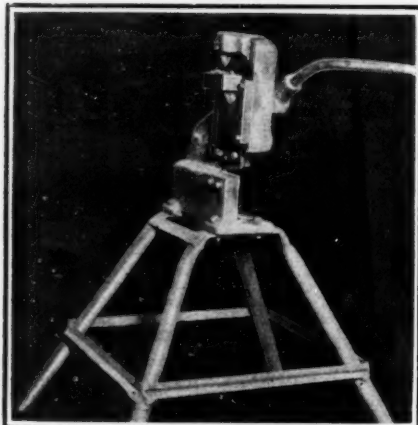


Fig. 1—Boltless Stand

Here is the home-made stand upon which is mounted the punch and shear. The frame structure was welded together in a short time.

angle iron, bars, and a welding outfit were the only material necessary. Two pieces of pipe were cut to length, then heated and flattened for a short distance in the middle. They were bent so that when placed in position the legs had a good, stable spread. The two pipes were held in this position, properly spaced at the top, with reference to bolt holes already cut, and shear punch mounted. Thus a strong base was made in about an hour.

The apparatus partly shown in Fig. 2 is a home-made sheet bending machine which will make any internal angle from 30 to 130 deg., and is the product of the ingenuity of the managers of this sheet metal shop and the flexibility of welding processes. The shop had received a rush order for some rectangular tanks. Neat bends must be made in wide sheets. Inquiry was made for a sheet bender, but it

could not be delivered for three weeks. This was almost as long as the time allowed for delivery of the tanks.

In this dilemma it was decided to make a bending machine at home. After about two days' intermittent work, the machine illustrated was produced. It consists of three 6x6½-in. angles mounted on a welded pipe frame. The sides of the angle legs, which come in contact with the sheet, are faced.

The back or base angle is welded to the frame; the top angle closed to 30 deg. and suspended in vertical bars at each end. That is to say, a bolt is secured in a piece welded into each end of the angle. This bolt passes through a slotted hole in a vertical bar attached to the pipe frame, and ends in a disk to which a handle is fastened. This disk also has a pin set in it off center, which projects into the vertical bar and acts as a fulcrum. Thus, when the handle is moved, the angle is lifted or lowered to pass or lock a sheet between it and the base angle.

The third or bending angle is hinged back to back with the base angle. It

is trussed, as shown in the illustration, and is equipped with handles by which it can be rotated.

The bending apparatus is shown in position ready for the insertion of a sheet. When the line of bend is directly above the heel of the base angle, the upper one is lowered and clamped down to the sheet, then the bending angle is swung up until the required bend has been made.—*Oxy-Acetylene Tips.*

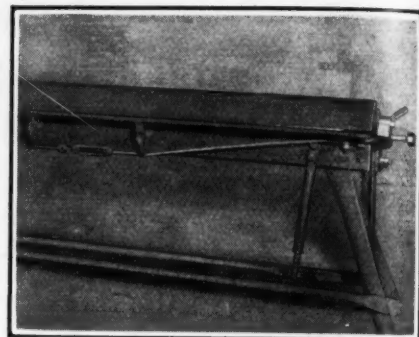


Fig. 2—Welded Parts for Bender

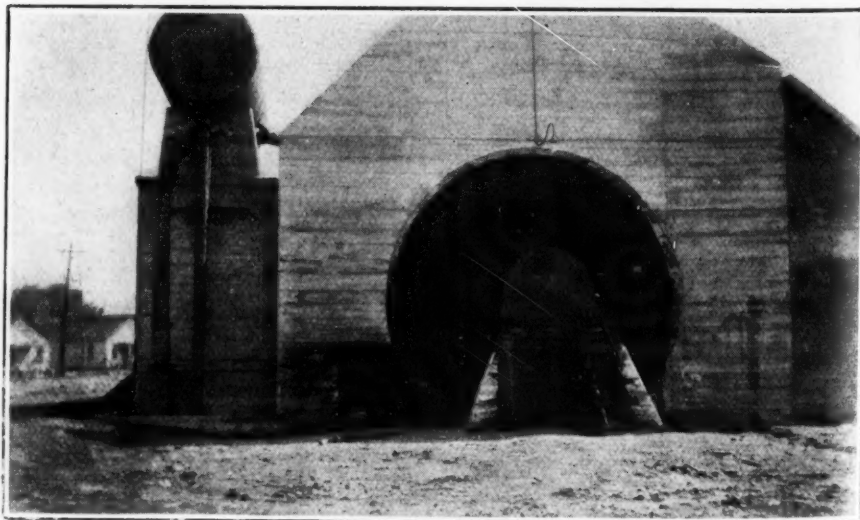
All mining plants at some time or another must replace chutes or screens. Some think it is difficult to shape sheet-iron, but here is a machine made at the mines which makes the work easy.

Fan Exhaust Supplies Heat For Wash Water

At the O'Gara No. 12 mine near Harrisburg, Ill., exhaust steam from the steam-driven fan is used to heat the wash water in the bath house.

The complete housing and airway of the fan is constructed of concrete. At the end of the fanhouse is a large steel tank into which the exhaust from the steam engine discharges. Water, supplied from a reservoir nearby, circulates through this tank and is thus warmed. The heated water is then conducted to the wash room.

The method of heating is similar to that used in many boiler plants for heating feed water. Fans, being the most continuously operated machines around a coal mine plant, consume much power and therefore savings effected by devices attached to fans quickly mount into large figures.

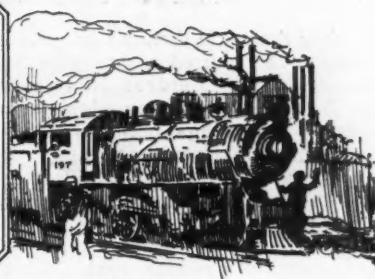


Water-Heating Tank Conserves Wasted Energy

Wash water for the bathhouse is heated at the O'Gara No. 12 plant by the exhaust from the fan engine. Warm water is always available because the fan operates continuously.



Production And the Market



Seasonal Lull Hits Bituminous Coal Market; Caution Marks Anthracite Trade

Snappy weather throughout a large portion of the Middle West has injected some much needed vim into the steam coal business of that locality though domestic demand is somewhat slow when considered in relation to output. Trade in the Southwest also shows some improvement with a dip in the temperature. Little of outstanding interest marks the trade in other sections, which is of a spotty character, varying from minor gains at Pittsburgh to sagging tendencies in Kentucky. Indifference seems to be the attitude in Ohio, Atlantic seaboard and New England markets. On the whole the industry apparently is suffering from a seasonal lull that seldom fails to appear at this time of the year. The real unsettling element, of course, is the closing of lake navigation.

About the only feature of strength in the market is in screenings, which are in somewhat limited supply with consequent firmness in price tendency. The dearth is not due to any growth in demand, however, but is merely the natural corollary of the curtailed call for lump. Monthly government surveys of industrial conditions continue to show increased employment in most sections, save in New England, where the situation is not changing much.

Moderate Demand for Anthracite

Demand for hard coal is marked by extreme caution, orders being fitful and in small lots. Yards are well stocked except for stove, the call for which is so steady that some operators are breaking down egg to keep pace with the demand for the more popular size. Chestnut also is quite strong, in some instances commanding the same price as stove. Egg and pea are in difficulty, however, some producers sending pea to storage piles.

Steam sizes are rather quiet, especially buckwheat No. 1; rice and barley are somewhat more active. With the falling off in demand it is probable that but for the curtailment of output by outlaw strikes there would be a softening in independent prices.

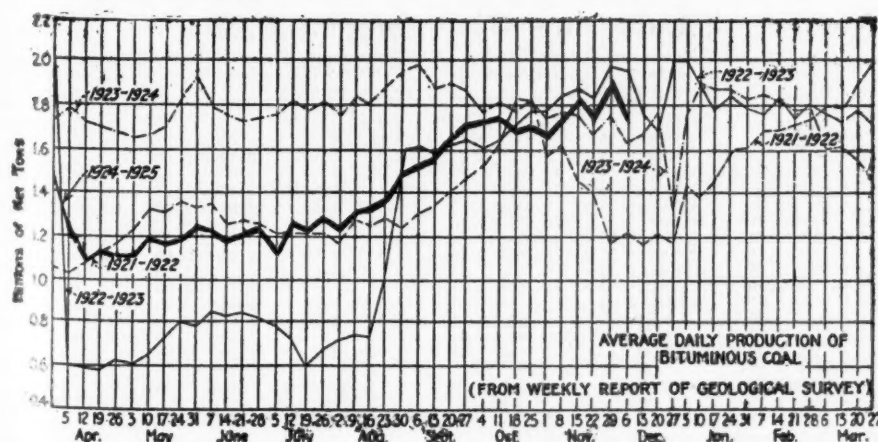
Within the last few weeks more than 5,000 mine workers have sailed from New York for their native lands to spend the holiday season and in many instances the entire winter months. It is expected that before the year ends the number will have been increased to nearly 10,000 mine workers and their families.

Coal Age Index of spot prices of bituminous coal has taken another tumble, standing on Dec. 15 at 169, the corresponding price for which is \$2.04, compared with 171 and \$2.07 respectively for the preceding two weeks.

Hampton Roads Dumpings Heavy

Another marked increase in activity took place at Hampton Roads, dumpings of coal for all accounts during the week ended Dec. 11 totaling 479,099 net tons, surpassing the high mark of the previous week by 43,377 tons.

Bituminous coal production advanced substantially during the week ended Dec. 6, when, according to the Geological Survey, 10,612,000 net tons was produced. This was an increase of 972,000 tons—as shown by revised figures—over the preceding week, when operations were curtailed by the observance of Thanksgiving Day. Incidentally this was the fourth consecutive week in which output exceeded that of the corresponding week of last year. Anthracite output also turned upward after the holiday, the total for the week ended Dec. 6 being 1,814,000 net tons, compared with 1,611,000 tons during the previous week.



Estimates of Production

(Net Tons)		
BITUMINOUS		
	1923	1924
Nov. 22.....	10,160,000	10,559,000
Nov. 29 (a).....	8,943,000	9,640,000
Dec. 6 (b).....	9,829,000	10,612,000
Daily average.....	1,638,000	1,769,000
Cal. yr. to date (c)...	514,200,000	433,797,000
Daily av. to date.....	1,791,000	1,510,000
ANTHRACITE		
Nov. 22.....	2,031,000	1,827,000
Nov. 29.....	1,691,000	1,611,000
Dec. 6.....	1,837,000	1,814,000
Cal. yr. to date (c)...	87,952,000	84,652,000
COKE		
Nov. 29.....	245,000	158,000
Dec. 6 (b).....	265,000	173,000
Cal. yr. to date (c)...	17,150,000	8,938,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.

Midwest Screenings Stiffen

Slow domestic demand in proportion to the available production has caused a strengthening of the steam market in the Midwest. Central Illinois fine coal has advanced to \$1.75, which gives it an edge over the higher grade southern Illinois screenings because of its short rate to the great consuming market in Chicago. Southern Illinois 14-in. coal brings an average of \$1.60 and 2-in. about \$1.75.

The weather throughout the central region is snappy, running to bluster, but this has induced very little domestic business in most territories, at the same time increasing the tendency to produce coal. This combination has nearly broken down circulars on lump and egg, but hope for immediate cold weather staved off this calamity. The unsettled freight rate situation from the East to the Northwest causes a good deal of uncertainty in the market for Illinois and Indiana coal in Wisconsin and Minnesota.

Southern Illinois egg is hard to move and nut is worse, and the poor working time in the last couple of weeks has put all mines behind on their screening business. Mines that had been getting two and three days a week are doing better now, but they are piling up coal hoping for a cold wave. Strip mines continue to do well. Cars are plentiful, movement good and railroad tonnage fairly good. In the Duquoin-Jackson County field conditions are somewhat similar to those in the Carterville district excepting that coal is not moving as freely and working time is not as good.

The quietness that has prevailed in the Mt. Olive field was broken this week with the movement of domestic coal. Some of this is moving to the Northwest and some locally, while steam is moving to Chicago. In the Standard field there is little activity. A little coal is always moving but large volumes are on hand and prices are about cost or below. Mines are getting from one to three days a week. Railroad tonnage is light and pessimism covers the field. The only thing in this district that shows any change is screenings, which range from \$1.10 to \$1.25.

In St. Louis a little cold weather and a little more demand, principally for the middle grades of coal, is all that can be reported. There is practically no demand for anthracite or smokeless and coke is just a trifle better. Cold weather, of course, forces the poorer classes to buy coal and this usually is Standard, but this business is not in the volume that would be expected. Dealers' yards are all loaded. Local wagonload steam is good. The trucking of coal over the Free Bridge from East St. Louis is now under way in order to overcome a 45c. differential rate in the freight rate of coal from East St. Louis. This movement is still small but threatens to grow.

Kentucky Prices Sag

Last week saw the weakest coal market in many weeks in Louisville, demand being light and offerings heavy. Screenings are holding firmly due to reduced production of prepared sizes in both fields. The small prepared sizes that

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†	Midwest		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†
Smokeless lump.....	Columbus....	\$3.35	\$4.10	\$4.10	\$4.00@4.25		Franklin, Ill. lump.....	Chicago.....	\$3.60	\$3.35	\$3.35	\$3.00@3.50	
Smokeless mine run.....	Columbus....	2.10	2.00	2.00	1.75@2.25		Franklin, Ill. mine run.....	Chicago.....	2.35	2.35	2.35	2.25@2.50	
Smokeless screenings.....	Columbus....	1.25	1.25	1.25	1.20@1.35		Franklin, Ill. screenings.....	Chicago.....	1.80	1.45	1.50	1.50@1.75	
Smokeless lump.....	Chicago.....	3.35	3.85	3.85	3.75@4.00		Central, Ill. lump.....	Chicago.....	3.00	2.85	2.85	2.75@3.00	
Smokeless mine run.....	Chicago.....	1.80	1.85	1.85	1.75@2.00		Central, Ill. mine run.....	Chicago.....	2.10	2.20	2.20	2.15@2.25	
Smokeless lump.....	Cincinnati.....	3.10	4.00	3.85	\$5.00@4.00		Central, Ill. screenings.....	Chicago.....	1.50	1.30	1.35	1.60@1.75	
Smokeless mine run.....	Cincinnati.....	2.00	1.85	1.85	1.75@2.00		Ind. 4th Vein lump.....	Chicago.....	3.25	3.10	3.10	3.00@3.25	
Smokeless screenings.....	Cincinnati.....	1.50	.95	.95	1.10@1.25		Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@2.50	
Smokeless mine run.....	Boston.....	4.40	4.25	4.10	4.00@4.25		Ind. 4th Vein screenings.....	Chicago.....	1.70	1.55	1.55	1.50@1.60	
Clearfield mine run.....	Boston.....	1.90	1.95	2.00	1.70@1.85		Ind. 5th Vein lump.....	Chicago.....	2.50	2.75	2.75	2.50@3.00	
Cambria mine run.....	Boston.....	2.35	2.30	2.30	2.10@2.50		Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25	
Somerset mine run.....	Boston.....	2.15	2.05	2.15	1.85@1.40		Ind. 5th Vein screenings.....	Chicago.....	1.50	1.20	1.30	1.25@1.35	
Pool 1 (Navy Standard).....	New York.....	3.00	2.80	2.80	\$6.50@9.95		Mt. Olive lump.....	St. Louis.....	3.10	3.00	3.00	3.00	
Pool 1 (Navy Standard).....	Philadelphia.....	2.95	2.70	2.70	2.50@2.90		Mt. Olive mine run.....	St. Louis.....	2.50	2.35	2.35	2.25@2.50	
Pool 1 (Navy Standard).....	Baltimore.....	2.95	2.30	2.30	2.10@2.50		Mt. Olive screenings.....	St. Louis.....	1.75	1.10	1.10	1.00@1.25	
Pool 9 (Super. Low Vol.).....	New York.....	2.25	2.10	2.05	1.90@2.25		Standard lump.....	St. Louis.....	2.85	2.75	2.75	2.75	
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.25	2.15	2.15	1.95@2.35		Standard mine run.....	St. Louis.....	1.95	1.95	1.95	1.90@2.00	
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.25	1.70	1.70	1.65@1.80		Standard screenings.....	St. Louis.....	1.35	1.05	1.05	1.00@1.15	
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.00	1.80	1.80	1.65@2.05		West Ky. lump.....	Louisville.....	3.00	2.85	2.60	\$2.25@2.60	
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	1.85	1.75	1.75	1.65@1.90		West Ky. mine run.....	Louisville.....	1.75	1.60	1.60	1.35@1.75	
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.20	1.55	1.55	1.50@1.65		West Ky. screenings.....	Louisville.....	1.15	.90	1.10	1.00@1.25	
Pool 11 (Low Vol.).....	New York.....	1.60	1.60	1.60	1.50@1.75		West Ky. lump.....	Chicago.....	2.85	2.75	2.60	\$2.25@2.60	
Pool 11 (Low Vol.).....	Philadelphia.....	1.65	1.45	1.45	1.35@1.60		West Ky. mine run.....	Chicago.....	1.75	1.55	1.55	1.40@1.70	
Pool 11 (Low Vol.).....	Baltimore.....	1.90	1.45	1.45	1.40@1.50								
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.).....	New York.....	1.60	1.50	1.50	1.40@1.65		Big Seam lump.....	Birmingham.....	3.85	3.10	3.10	\$2.50@3.25	
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.65	1.50	1.50	1.40@1.60		Big Seam mine run.....	Birmingham.....	1.95	1.70	1.70	1.50@1.75	
Pool 54-64 (Gas and St.).....	Baltimore.....	1.85	1.45	1.45	1.40@1.50		Big Seam (washed).....	Birmingham.....	2.35	1.85	1.85	1.75@2.00	
Pittsburgh ac'd gas.....	Pittsburgh.....	2.55	2.40	2.40	2.30@2.50		S. E. Ky. lump.....	Chicago.....	3.10	2.75	2.75	\$2.50@2.75	
Pittsburgh gas mine run.....	Pittsburgh.....	2.25	2.10	2.10	2.00@2.25		S. E. Ky. mine run.....	Chicago.....	1.85	1.60	1.60	1.40@1.60	
Pittsburgh mine run (St.).....	Pittsburgh.....	2.05	1.85	1.85	1.75@2.00		S. E. Ky. lump.....	Louisville.....	3.10	3.00	2.85	\$2.50@2.75	
Pittsburgh slack (Gas).....	Pittsburgh.....	1.50	1.20	1.20	1.15@1.25		S. E. Ky. mine run.....	Louisville.....	1.75	1.60	1.60	1.35@1.50	
Kanawha lump.....	Columbus.....	2.85	2.30	2.30	2.10@2.25		S. E. Ky. screenings.....	Louisville.....	1.15	.90	.95	.85@1.10	
Kanawha mine run.....	Columbus.....	1.60	1.55	1.55	1.45@1.65		S. E. Ky. lump.....	Cincinnati.....	2.85	2.75	2.85	\$2.00@2.75	
Kanawha screenings.....	Columbus.....	.95	.90	.90	.80@1.00		S. E. Ky. mine run.....	Cincinnati.....	1.55	1.50	1.55	1.25@1.75	
W. Va. lump.....	Cincinnati.....	2.85	2.85	2.60	1.90@2.50		S. E. Ky. screenings.....	Cincinnati.....	1.00	1.00	.95	.75@1.10	
W. Va. gas mine run.....	Cincinnati.....	1.60	1.45	1.45	1.40@1.65		Kansas lump.....	Kansas City.....	4.75	4.75	4.75	4.50@5.00	
W. Va. steam mine run.....	Cincinnati.....	1.60	1.45	1.45	1.30@1.50		Kansas mine run.....	Kansas City.....	3.25	3.35	3.10	\$2.75@3.25	
W. Va. screenings.....	Cincinnati.....	.80	1.00	1.00	.80@1.10		Kansas screenings.....	Kansas City.....	2.00	2.30	2.30	2.25@2.35	
Hooking lump.....	Columbus.....	2.90	2.55	2.55	2.35@2.75								
Hooking mine run.....	Columbus.....	1.85	1.60	1.60	1.50@1.75								
Hooking screenings.....	Columbus.....	1.15	.80	.80	.75@.90								
Pitta. No. 8 lump.....	Cleveland.....	2.45	2.40	2.45	\$2.00@2.85								
Pitta. No. 8 mine run.....	Cleveland.....	1.95	1.85	1.85	1.85@1.90								
Pitta. No. 8 screenings.....	Cleveland.....	1.60	1.20	1.20	1.25@1.50								

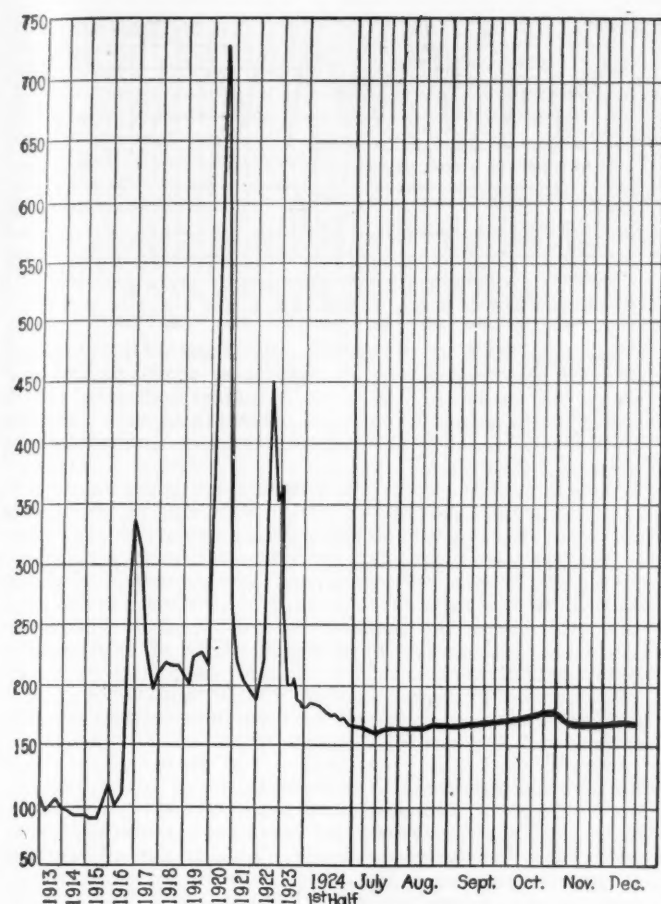
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Dec. 17, 1923	Dec. 8, 1924	Dec. 15, 1924†
Broken.....	New York.....	\$2.34		\$8.50@10.00	\$8.00@9.25	\$8.00@9.25
Broken.....	Philadelphia.....	2.39				
Egg.....	New York.....	2.34		9.85@10.50	8.75@9.25	8.75@9.25
Egg.....	Philadelphia.....	2.39		9.85@12.20	8.75@9.25	8.80@9.25
Egg.....	Chicago.....	5.06		9.60@12.50	8.00@8.35	8.17@8.25
Stove.....	New York.....	2.34		9.85@11.00	8.75@9.25	9.00@9.50
Stove.....	Philadelphia.....	2.39		9.85@12.20	8.90@9.25	9.15@9.50
Stove.....	Chicago.....	5.06		9.60@12.50	8.00@8.35	8.63@8.75
Chestnut.....	New York.....	2.34		9.85@11.00	8.75@9.25	9.00@9.50
Chestnut.....	Philadelphia.....	2.39		9.85@12.20	8.90@9.25	9.15@9.50
Chestnut.....	Chicago.....	5.06		9.60@12.50	8.00@8.35	8.44@8.60
Pea.....	New York.....	2.22		6.00@7.25	6.15@6.65	5.50@6.00
Pea.....	Philadelphia.....	2.14		6.35@7.50	6.35@6.60	5.75@6.00
Pea.....	Chicago.....	4.79		6.00@6.75	5.40@6.05	5.13@5.45
Buckwheat No. 1.....	New York.....	2.22		2.00@3.00	3.50	3.00@3.15
Buckwheat No. 1.....	Philadelphia.....	2.14		2.25@3.50	3.50	3.00
Rice.....	New York.....	2.22		1.35@2.25	2.50	2.00@2.25
Rice.....	Philadelphia.....	2.14		1.75@2.50	2.50	2.25
Barley.....	New York.....	2.22		1.25@1.50	1.50	1.25@1.50
Barley.....	Philadelphia.....	2.14		1.00@1.50	1.50	1.50
Barley.....	New York.....	2.22		1.25@1.45	1.60	1.40@1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Dec. 15	Dec. 8	Dec. 1	Dec. 17
Index	169	171	171	181
Weighted average price	\$2.04	\$2.07	\$2.07	\$2.19

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

are moving for steam use are holding fairly well, but block, egg and lump are all weaker. Considerable distress coal is in various markets and a lot of "no bill" coal is on track in the coal fields, and some operators who have overproduced are on the verge of shutting down. Others are offering ridiculously low figures in an effort to force movement.

There is much undercutting of circulars. For instance, it is reported that some of the large producers in western Kentucky were so overloaded with unsold coal within the past few days that in some instances 6-in. block was shipped on high grade mine run orders at \$1.75 a ton, and mine run in some instances was shipped on nut and slack orders. The block market while quoted at \$2.25@2.50 is weak as a result of block being offered as low as \$2@2.25. Lump is offered at the latter figure, but egg has been in better demand and is quoted at \$2.10@2.35, with nut at \$1.50@1.85 and mine run, \$1.35@1.75. Screenings are \$1@1.25. In eastern Kentucky a few specialty coals are quoted at \$3@3.25 and perhaps higher, but the block market is \$2.50@2.75 on good grades, with lump \$2.25@2.50; egg, \$1.75@2.15; nut, \$1.60@1.90; mine run, \$1.35@1.60 and screenings, 85c.@1.10.

Northwest Trade Is Fair

Navigation, as far as coal is concerned, closed officially Dec. 10 at the Head-of-the-Lakes. In all, 30 cargoes arrived during the last week, of which one was hard coal. In the receipts were several cargoes of Pocahontas, which puts this coal again on the Duluth market. Official figures of receipts during November show that 1,186,790 tons of soft and 67,434 tons of hard were received. This brings the

receipts for the season up until Nov. 30 to 1,264,705 tons of hard coal and 7,541,453 tons of soft coal.

Stocks on docks at present are estimated at 7,500,000 tons of soft coal and about 800,000 tons of hard coal. The normal consumption between now and the opening of navigation usually is about 5,000,000 tons of soft coal. Figuring this way, there will be plenty of soft on the docks at the opening of navigation. The anthracite outlook is far from bright, as consumers are burning anything but hard coal. Shipments from the docks last month were the heaviest in two years. In all 28,755 cars went out as against 26,415 in October, and 27,696 in July, 1922, which was the largest previous month. Docks are working overtime and some of them on Sunday.

Movement of coal from the docks in Milwaukee is only fair. The weather has spurred consumers a little, but there will be no rush for fuel until real winter cold waves send the temperature down to zero and below. Four cargoes of coal are now upward bound for Milwaukee. Their arrival will mark the close of the season for cargo coal. The receipts for December up to and including the 10th were 28,900 tons of anthracite and 85,668 tons of bituminous coal—a total of 114,568 tons. The receipts for the season up to the 10th were 805,862 tons of anthracite and 2,587,023 tons of bituminous coal—3,392,885 tons in all. The receipts of cargo coal in 1923, up to Dec. 11, when the season closed, totaled 966,224 tons of anthracite and 3,238,722 tons of bituminous coal—4,204,946 tons in all.

Western Trade Improves

A little cold weather through Kansas and Oklahoma in the last week has reduced the surplus of domestic grades at the mines and has slightly improved operating time in the Southwest. But several weeks of cold will be necessary to bring production up to normal for this time of year. The improvement is not yet sufficient to eliminate shading.

In Colorado the cold weather which has prevailed for the past several days has naturally stimulated the market, particularly for lignite. There has been a slight improvement in the market for Colorado coals in Nebraska, Kansas and South Dakota. This has resulted in increased production and the mines are now operating at about 70 per cent.

The prevailing prices on the lignite coals in northern Colorado are \$3 for Weld County and \$4.25 for Boulder County. Southern Colorado bituminous is \$5.25 for lump, \$4.25 for nut and \$3.50 for pea (washed). Prices in the Dawson-Raton district, New Mexico, are: Domestic lump, \$4.50; nut, \$4; egg, \$4.50; pea, \$3.50. Coke prices for Dawson, New Mexico, are \$6, \$7.50 and \$8.75; for Colorado (Minnequa Segunda), \$6@7.50.

In spite of the heavy snowstorms in Utah working time at the mines has not increased appreciably, being still around 60 per cent of capacity. Stocks are much below normal. Dealers report a brisk demand for pea coal and slack for heating. All other sizes are in only fair demand. Railroads are taking very little coal now. Most of them are picking up their stocks. The metal industry continues to be the best industrial customer for coal.

Spirits Flag in Ohio Markets

Fairish winter weather has failed to revive the flagging spirits of the Cincinnati market. "Free coal" is becoming increasingly hard to move and a clutter of "no bill" cars at the yards of originating railways has added to the gloom. Retailers are inclined to hold off from purchases rather than carry such stocks in their inventories at the close of the year. Prices on bituminous have a broad range, one large West Virginia company with mines in Logan County having cut under \$2, though specialized coals from Coal River, Elkhorn and Perry County are being sold as high as \$4 a ton for domestic block and 4-in. lump. Egg is a drug on the market, but mine run shows slight price variation. Nut and slack and smaller sizes of resultant also hold up well. The smokeless market is suffering from inertia following the closing of the lakes. River business is booming with the stage holding at a good depth.

Trade at Columbus continues spotty. Domestic business is still slow due to continued unfavorable weather in many localities. Retail stocks are generally heavy and dealers are slow in placing orders. Many are making extremely low quotations to reduce stocks. The so-called fancy grades are in best demand, although the edge is off the Pocahontas market. Steam business is dull and featureless. Considerable demurrage coal, particularly in Toledo and Detroit,

has affected the Columbus market. Reserves are good and in some cases consumers are using these in preference to buying on the market. Overproduction of steam grades appears to be the main factor.

At Cleveland there is a scarcity of slack and nut-and-slack, which have stiffened 5c. to 15c. per ton during the week. Apparently many steam consumers failed to lay in reserves in these grades when the supply was plentiful, consequently, with the production of lump considerably off and the demand for slack stronger at this season of the year than is ordinarily the case, it is freely predicted that spot prices on these grades will continue to advance. Inquiries from steam consumers, other than for these grades, continue to be negligible because of hand-to-mouth buying.

Nominal Gain in Pittsburgh Market

The Pittsburgh market shows a slight gain in tonnage turnover and slightly increased irregularity in prices, but broadly speaking there is no substantial change. Small lot inquiries in the spot market are more numerous but prices are not quotably changed except that steam slack now brings \$1.10@\$.1.20 against a flat price of \$1.10 formerly quoted. The steel industry is running at a considerably better rate, but that does not seem to help steam coal.

The situation at Buffalo is not improving much, except that the feeling is better. Scarcity of slack has brought up the price about 20c., but that is merely because so little lump is selling that slack is scarce. There is some improvement in business generally and it looks as if by the first of the year the demand for soft coal would be considerably better. Non-union mines are practically furnishing the coal. The lake trade is at an end, with shipments of 2,616,550 tons, as against 2,907,320 tons the previous season.

Only Casual Demand in New England

The New England market shows little change. Steam coals are in ample supply and there is only casual demand for relatively small tonnages. Inquiry for spot shipment in cargo lots is light, and about the only opening for tidewater coal is for distribution inland from ports like Boston, Providence and Portland. The industrial situation does not improve, although there are textile and shoe manufacturers who look for better business early in 1925. Generally, the steam grade is dragging on the bottom with prices in most quarters at the lowest point of the year.

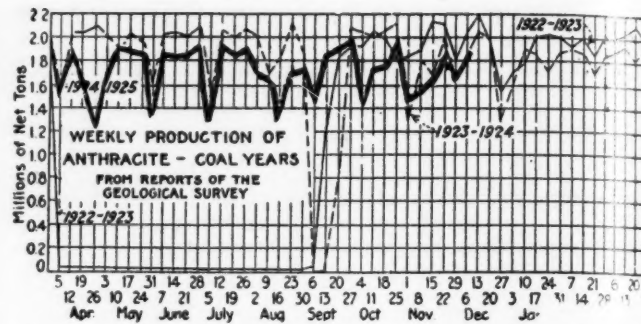
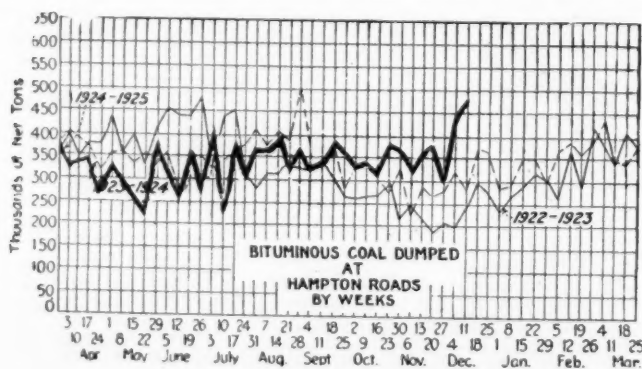
At Hampton Roads there continue to be fresh accumulations that the agencies are canvassing this territory to sell. The range is \$4@\$.4.25 per gross ton f.o.b. vessel for smokeless coals, the actual price depending upon mine origin and the reputation of the coal.

All-rail from central Pennsylvania there is nothing more than the current moderate request that has been characteristic for several months and prices are on the same minimum basis. Most of the tonnage coming forward by water from New York and Philadelphia piers is restricted to specialties, including coal for gas producing, the quantity of ordinary steam coal moving in these channels being very small.

Prices on cars Boston at the rehandling wharves are wavering from \$4.25@\$.4.35 per gross ton. Those factors who lack unloading facilities of their own are hard put to it to dispose of current arrivals and at the same time keep coal coming forward.

Lull in Atlantic Seaboard Markets

Buyers are taking but little interest in the coal market at New York, though a few days of seasonable temperatures last week did create a little better demand for spot coal.



There have been no changes in quotations. Operators and shippers continue to evince optimism that business and prices will be better after Jan. 1. More contracts are expected to be closed than were closed this year. Demand for tidewater coal is dull, but the tonnage coming forward is moving with little pressure.

Wheels of industry at Philadelphia are going at a pretty fair speed, and while the average coal buyer is inclined to lessen purchases with the approaching end of the year, there is much new business being placed. The best demand is for the higher grades of Pennsylvania low volatiles. Gas slack is in limited supply.

At Baltimore the demand for soft coal has continued about on the average of the past three or four months. Industrial buyers are taking in small quantities as needed. The export situation continues dull, although the first 12 days of December showed a marked improvement over the corresponding period of November.

Domestic trade is practically flat at Birmingham, awaiting weather favorable to renewed business in the wholesale line. There is no material change in the steam market over a week ago. Fairly heavy rains last week probably will enable hydro-electric power plants to curtail operation of steam standbys, which have been heavy consumers of coal during the long drought. Railroads and other contract consumers are taking a little more coal, but are said to be already fairly well stocked against holiday interruption. Buying of commercial fuel is still restricted largely to immediate needs.

Anthracite Trade Unsteady

Unsteadiness characterized the anthracite market at New York last week. Orders were less plentiful and it was the belief in some offices that but for the outlaw strikes in the coal fields the lessened demand might have reduced independent prices. Stove coal continues to move steadily and the demand is so strong that several operators are breaking down egg in order to meet the demand for the smaller size. Chestnut is gaining strength and in several instances is quoted at the same price as stove size. Pea is troublesome to move and is being sent to storage by some operators. Buckwheat No. 1 is slow but rice and barley are fairly active.

Philadelphia consumers are buying cautiously, as 90 per cent of all orders received are for single tons. Yards are well stocked except for nut, for which there is a steady call. There have been no further price increases. Egg and pea are causing trouble and steam sizes are rather slow.

Hard coal men at Baltimore report only a moderate demand, mainly due to the remarkably open weather. Many consumers who ordinarily begin to run out of coal about this time are still running along on the light supplies already laid in. The exhibit of devices arranged to burn buckwheat coal is to open in a few days.

Trade at Buffalo is as dependent on the weather as it is with winter going out and the prospect is that the trade will be in a slow-go-easy way all winter. There is talk of more advancing of price, supposed to be on account of the cost of the many strikes that have beset certain districts, but the consumer pays little attention to it.

Car Loadings, Surpluses and Shortages

	Cars Loaded			
	All Cars	Coal Cars		
Week ended Nov. 29, 1924.....	878,631	172,033		
Previous week.....	1,010,122	193,533		
Week ended Dec. 1, 1923.....	835,081	156,613		
	Surplus Cars			
	All Cars	Coal Cars		
Nov. 30, 1924.....	183,914	82,819		
Nov. 22, 1924.....	166,101	84,367		
Nov. 30, 1923.....	153,057	80,756	1,336	605

Foreign Market And Export News

British Market Develops Strength; Idle Pits Resume

Renewed strength has appeared in the South Wales coal market, steady improvement and material reduction of stocks being in evidence. Several pits are resuming operations after three months of idleness.

Interest is chiefly centered in business for the early part of next year. Most collieries are well booked over December, but January bookings are only moderate. There is a fair demand for large steams, and small steams have improved.

Coal depot exporters have booked 250,000 tons of second Admiralty large over 1925 at 25s. to 25s. 6d. f.o.b., and the Admiralty has placed contracts aggregating 350,000 tons of second and best large steams at from 26s. to 27s. The Egyptian State railways have contracted for 200,000 metrical tons of Monmouthshire large steams for de-

livery beginning January to May, at 34s. 8d. to 34s. 11d. c.i.f. Alexandria has placed a contract for an equivalent amount at 24s. to 24s. 3d. f.o.b.

The general tone of the Newcastle market has improved, general inquiry being quite satisfactory, especially for gas and steam coals. Best steams are now being sold ahead for delivery next year for 19s. f.o.b. Around 70,000 tons of Durham gas coals have been sold to Italy and Sweden. Bunker coals are going better though they still glut the market. There is still considerable unemployment and short time.

Production by British collieries in the week ended Nov. 29, a cable to *Coal Age* states, was 5,303,000 tons, according to official reports. This compares with 5,309,000 tons produced in the preceding week.

Foreign Trade Lightens Dullness At Hampton Roads

Business at Hampton Roads is dull, with demand for coastwise light and bunker trade only fair. A slight increase noted in foreign buying has proved a temporary stimulant.

Many mines have reported that they are preparing to shut down for the holidays, and the trade at Hampton Roads expects little improvement in business until the new year. Domestic retail business is suffering from unusually warm weather.

Sluggish Tendency Prevails in French Coal Market

Inquiry for industrial fuels in the French coal market is slightly heavier while the house coal situation remains quiet. The mines, however, are shipping regularly on existing contracts. Because of lessened demand French importers are refusing any additional tonnage from Belgium for the moment.

On the other hand, arrivals from Great Britain are normal.

With regard to German commercial coals, the high prices asked by the Coal Syndicate have curtailed French buying. There are 5,000,000 tons of coal now lying in the Ruhr, and they will move only if the Germans quote reasonable prices. In order to find new outlets, they are now facilitating payments by allowing credit of three to six months.

The wage convention now in force in the Nord and Pas-de-Calais mine will end Dec. 31, and the labor unions have appointed a subcommittee to take up the task of obtaining higher pay for the mine workers.

From Nov. 16 to 22, France and Luxemburg received 117,800 tons of indemnity fuel, of which 36,600 tons was coal, 74,700 tons coke and 6,500 tons lignite briquets. Deliveries of Ruhr coke in November amounted to 174,138 tons, an average of 5,800 tons a day, compared with 8,500 to 9,000 tons previously. Receipts for the first three

days of the current month were 39,046 tons, a daily average of 13,000 tons. The price of indemnity coke is unaltered and presumably will remain so for some time.

Export Clearances, Week Ended Dec. 13, 1924

FROM HAMPTON ROADS	
For Argentina:	Tons
Ital. Str. Adige, for Buenos Aires.....	9,275
For Brazil:	
Br. Str. Avonmede, for Rio de Janeiro.....	6,057
Fr. Str. Germaine L. D., for Rio de Janeiro...	6,119
Br. Str. General Smuts, for Rio de Janeiro...	5,549
For Canada:	
Nor. Str. Sisto, for Halifax.....	1,471
Amer. Str. Melville Dollar, for Vancouver....	507
For Cuba:	
Nor. Str. Thorsal, for Havana.....	3,310
Br. Str. Berwindmoor, for Havana.....	9,654
For Italy:	
Ital. Str. Valsesia, for Porto Ferrajo.....	7,768
Ital. Str. M. T. Cicerone, for Porto Ferrajo...	9,226
For Porto Rico:	
Amer. Str. Lillian, for San Juan.....	4,877
For Peru:	
Peru. Str. Amazonas, for Callao.....	2,681
For West Indies:	
Br. Schr. Cutty Sark, for Kingston.....	580
Nor. Str. Fram, for Port of Spain.....	4,012
For—	
Dan. Str. Jan., for Puerto Tarafa (?).....	2,641

FROM PHILADELPHIA

For Cuba:	
Nor. Str. Sagaland, for Havana.....	—
Ger. Str. Rhon, for Havana.....	—
Br. Str. Stroma, for Havana.....	—
For Nova Scotia:	
Br. Schr. Jean F. Anderson, for Halifax	—

FROM BALTIMORE

For Egypt:	
Br. Str., Koranton, Alexandria.....	8,091
For Italy:	
Ital. str., Aster, Civita Vecchia.....	8,877

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Dec. 4	Dec. 11
Cars on hand.....	1,742	1,504
Tons on hand.....	108,290	98,697
Tons dumped for week.....	147,162	181,958
Tonnage waiting.....	30,000	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,970	1,910
Tons on hand.....	125,150	130,550
Tons dumped for week.....	114,211	115,270
Tonnage waiting.....	2,200	6,474
C. & O. Piers, Newport News:		
Cars on hand.....	1,848	2,053
Tons on hand.....	84,125	92,893
Tons dumped for week.....	125,889	130,539
Tonnage waiting.....	15,715	4,506

Pier and Bunker Prices, Gross Tons

PIERS		Dec. 6	Dec. 13†
Pool 9, New York....	\$4.75@ \$4.90	\$4.75@ \$4.90	
Pool 10, New York....	4.40@ 4.65	4.40@ 4.65	
Pool 11, New York....	4.20@ 4.45	4.20@ 4.45	
Pool 9, Philadelphia....	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia....	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia....	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads.	4.15	4.15	
Pool 2, Hamp. Roads.	4.00	4.10	
Pools 5-6-7 Hamp. Rds.	4.00	4.00	

BUNKERS

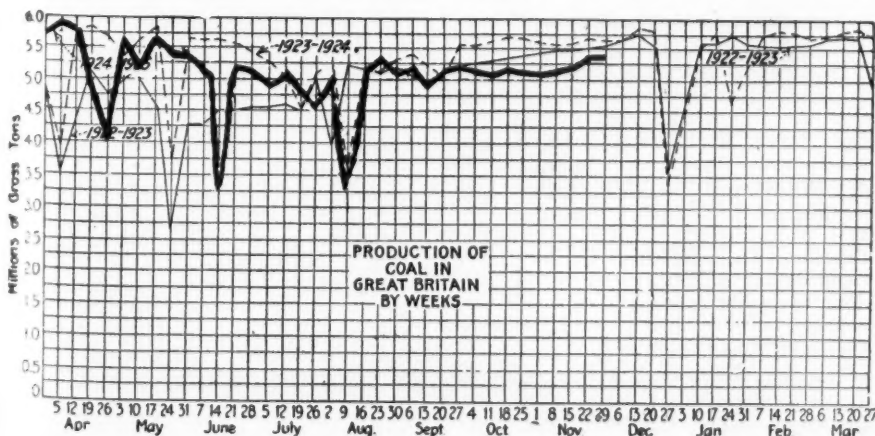
Pool 9, New York....	\$5.00@ \$5.15	\$5.00@ \$5.15
Pool 10, New York....	4.65@ 4.90	4.65@ 4.90
Pool 11, New York....	4.30@ 4.70	4.30@ 4.70
Pool 9, Philadelphia....	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia....	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia....	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads.	4.25	4.25
Pool 2, Hamp. Roads.	4.10	4.15
Pools 5-6-7 Hamp. Rds.	4.10	4.10

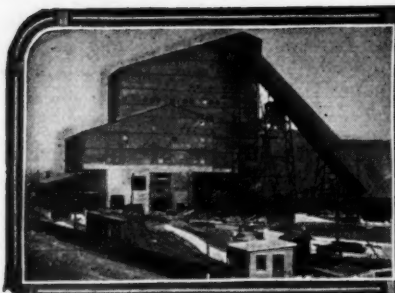
Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age

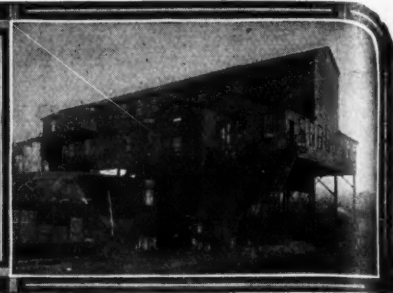
Cardiff	Dec. 6	Dec. 13†
Admiralty, large	27s. @ 27s. 6d.	27s. 6d.
Steam smalls....	16s.	20s.
Newcastle:		
Best steams....	18s. 9d. @ 19s.	18s. 6d. @ 18s. 9d.
Best gas.....	21s. 6d. @ 22s. 6d.	22s. @ 22s. 6d.
Best Bunkers....	17s. 6d. @ 19s.	17s. 6d. @ 19s.

†Advances over previous week shown in heavy type; declines in italics.





News Items From Field and Trade



ALABAMA

The Franklin Coal Mining Co. is constructing a 400-ton Montgomery coal washery at its Powhatan No. 2 mine, in the western end of Jefferson County, which will give the company a capacity of 750 tons of washed coal per day from its two openings.

Among increases in capital stock of corporations reported by the Secretary of State is the Union Coal Co., Walker County, \$1,100,000. This increase in capital is in connection with the recent acquisition of about 15,000 acres of coal lands from the Sloss-Sheffield Steel & Iron Co., by A. B. Aldridge, of Birmingham, and associates. An increase of \$100,000 also is reported in the capital stock of the Goodwin Coal Co., Inc. of Dora, Walker County.

ILLINOIS

Harry Tanner and Charles Law, of Pana, sold the Litchfield coal mine at Litchfield to John Puckett, of that city, for a reported price of \$60,000. Temple McDonald, of Hillsboro, has been named manager and will reopen the mine at once.

David Hagman and Grover Davis have formed a partnership to operate a new coal mine at Matherville.

Two mines in Springfield have been opened within the last few days. Empire Mine No. 1, owned by the Illinois Coal Co., has been opened with a large force. This is the old Jones and Adams mine east of the fair grounds. The Spring Creek Coal Co.'s mine west of the city on the Baltimore & Ohio Southwestern R.R. also has been opened with four hundred men working. A miners' train is being operated by the B. & O. S. W., from Second and Madison Streets, Springfield, to the mine. More than one-half of the thirty mines in the Springfield district will be in operation with the opening of these two mines. At one time during the summer only one-third of the mines were in operation.

G. W. Bower and son of Monett, Mo., with a company of men, are prospecting for coal near Pinckneyville. They are drilling south of that town where they have found coal within 18 ft. of the surface. They have forty tracts of forty acres each leased.

Mine No. 5 of the Spring Valley Coal Co., at Dalzell, has been permanently closed and sealed. The work of dismantling the mine will be begun at once. This mine was sunk in 1899 and was for several years considered one of the best of the Spring Valley Coal

Co.'s mines. The mine was closed Feb. 15, 1922, and since that time has been idle. The company also is closing its store at Spring Valley.

The Gano Moore Coal Mining Co., of Philadelphia, Pa., is about to purchase the properties of the defunct Southern Gem Coal Corporation of Illinois for \$2,000,000. The Philadelphia concern is said to have made the offer, and its acceptance depends upon the sanction of the federal district court in East St. Louis. A bond issue of \$1,175,000 and a miners' payroll of \$225,000 due more than a year ago are outstanding. There are various other claims against the properties totaling about double the \$600,000 which would remain of the purchase price of \$2,000,000.

IOWA

The McCagg mine, east of Knoxville, has been closed, the last ton of coal being billed out to the Rock Island R.R., which has been one of the largest customers of the mine. The McCagg mine was one of the largest mines in Marion County, having employed as many as 150 men, who made their homes in Knoxville and Flagler.

KENTUCKY

The U. S. Circuit Court of Appeals at Cincinnati held that the U. S. District Court at Jackson erred in refusing the Fordson Coal Co. a restraining order against W. J. Maggard, sheriff of Leslie County, and ordered the lower court to issue a preliminary injunction. The coal company had sought and been refused a restraining order against the sheriff from collecting more than \$11,797 taxes on its tract of 80,951 acres of land in Leslie County.

The Bulan Coal Co., Bulan, will soon begin erection of ten miners' cottages.

It is reported that a big coal merger is pending at Lexington for merging coal companies and coal properties in the Carrs Fork section of Eastern Kentucky. Companies mentioned as being interested in the deal are the Scuddy Coal Co., Montgomery Coal Co. and the Happy Coal Co. although President C. L. Ryley of the latter company denies it. It is claimed that if the deal is made a paper manufacturing concern of Providence, R. I., will take the bulk of the mine output.

Reports from the Whitesburg and Hazard districts of eastern Kentucky are to the effect that there has been a good deal of coal land leasing underway

and some new railroad construction is planned, one contract having recently been let. Much of the new development appears to be planned in the Carrs Fork Section above Vicco, on the Knott County border, according to reports. The fact that the Louisville & Nashville R.R. is to connect through that section with the Carolina, Clinchfield & Ohio, giving outlet to the South Atlantic, will materially improve traffic facilities in the district and enable operators to move coal more freely in times of good demand.

John W. Menzies, U. S. Court clerk at Covington, has gone to Prestonburg, in compliance with orders of federal court, as a special commissioner to sell the property, merchandise and equipment of the Liberty Coal Corporation in Floyd County. The sale follows the litigation in the case of T. H. Morris, trustee, against the Liberty Coal Corporation, which was filed in the federal court at Covington in November, 1922. The order of sale directs that the property shall not be sold for less than \$52,500. The land is divided into four tracts, all of which are located on the left fork of Beaver Creek in Floyd County.

MINNESOTA

The Berwind Fuel Co. has started working on a third addition to its briquet plant at Superior, Wis. The addition will be ready in the spring. The necessity for increased capacity bears testimony to the popularity which this form of fuel has gained at the Head-of-the-Lakes.

W. H. Godwin, vice-president of the Carnegie Coal & Dock Co., was at Duluth-Superior harbor last week, inspecting docks. He spoke most optimistically of the future, and said that he did not anticipate any great surplus of stocks in the spring.

NEW YORK

The Emergency Coal Board appointed by Governor Alfred E. Smith last year issued a report last week in which it assured consumers of coal that the coal situation is encouraging and that the supply is plentiful. "Information in our possession," said the board, "leads us to believe that there will be an ample supply during the coming winter. Should any emergency arise the committee stands ready to take command." The board members are General Charles W. Berry, George Eltz and Health Commissioner Monaghan.

OHIO

With no opposition all officers of the Ohio district of the United Mine Workers have been elected for the coming year. They are Lee Hall, president; G. W. Savage, secretary, and William Roy, vice-president.

John H. Eagleson, a Columbus attorney, has been named receiver for the Starr-Jackson Mining Co. upon the application of Adam Penman, who claimed a debt against the company. The concern has been operating a small mine near Logan, in the Jackson field. Offices in Columbus had been discontinued for some time.

While the date has not been definitely fixed, the court has decided that the assets of the Maynard Coal Co., of Columbus, which has been in the hands of receivers for about a year, will be sold at auction about Jan. 5 next. Receivers Williams S. Harman and Frank L. Stein have been instructed to advertise the properties when the date is definitely fixed. The assets consist of working mines in the Pomeroy field in Ohio and in the Hazard field in Kentucky.

Operations have been resumed again at the Webb mine of the Cambria Collieries Co., south of Bellaire, employing about 600 men. It had been idle since about the middle of July owing to a disagreement between the miners and the company. At a recent meeting of the members of Local Union No. 1840 terms of the company were agreed to and men were immediately ordered out to work. During the time the mine was in idleness a good deal of machinery and equipment was added.

PENNSYLVANIA

Unofficial returns from the biennial election of District No. 5, United Mine Workers (Pittsburgh) indicate the re-election of President P. T. Fagan, Vice-President W. J. Patton, Secretary-Treasurer William Hargest and all other officials seeking re-election.

Charles O'Neill, secretary of the Central Pennsylvania Coal Producers' Association, in a letter to the operators throughout the district, announces that no further action has been taken looking to an adjustment of the wage scale. Mr. O'Neill points out that with the resumption of work at a number of important operations where there are large unions which have repudiated the scale and allowed the men to return to work on the 1917 basis the situation will gradually adjust itself. He says the pressure of the movement among the miners who are without employ-

ment or money to support their families will bring about the solution of the problems facing the operators.

John Brophy, president of District No. 2, United Mine Workers (central Pennsylvania), with headquarters in Clearfield, was re-elected to that office at an election conducted throughout the district on Dec. 9. He had no opposition. The name of George Bassett, who had been nominated, did not appear on the official ticket. Richard Gilbert, secretary-treasurer, who has held that post for a quarter of a century, was re-elected without opposition. James Mark, the present vice-president, also was re-elected, he being the only one of the three with opposition.

Thirty employees of the Ebensburg Coal Co. at Colver, Cambria County, have organized to take the course in mining offered by Pennsylvania State College. W. G. Duncan, of the college mining department, organized the class, and the instructor in mining will be F. M. Maloy, while Thomas Brown will be the instructor in electrical work. The students will be awarded mine foreman certificates if they successfully complete the course.

The Shipman Coal Co., of Shamokin, has just closed a deal for the lease of a virgin tract at Maysville Park. The same firm is said to be dickering with the Lehigh Valley company for a lease on a tract close to the former's present operations, a royalty proposition having been suggested.

Local No. 4716, United Mine Workers, at Lilly, Cambria County, at a recent meeting adopted a resolution indorsing the action of the district officers in refusing to acquiesce in solicitations of the operators for a reduction in wages. The resolution sets forth that the local union believes that a reduction of wages is not the remedy for slack work.

James West, Sr., has just purchased 45 acres of coal in Luzerne township from the Superior Connellsville Coal & Coke Co. for \$77,514. All mining rights go with the sale of the land. The coal is said to be Pittsburgh 9 ft. coal. George Whyel is president of the Superior and transacted the deal with West.

Isaac Taylor, of Uniontown, is in the Presbyterian Hospital at Pittsburgh recovering from the amputation of his left leg above the knee on Friday, Dec. 5, on account of hardening of the arteries. He withstood the operation very well, especially considering his advanced age.

According to a report from Shamokin a deal is under way which will give the Madeira-Hill Coal Co. a lease on a

valuable portion of a tract owned by the Lehigh Valley Coal Co. between Johnson City and Kulptown. This tract is said to possess some of the richest seams in the anthracite region.

As a result of the decision of the U. S. Supreme Court upholding the constitutionality of the Pennsylvania anthracite tax, the state treasury will receive approximately \$6,000,000, held up by the litigation. In his biennial estimate of the expected revenues for the coming two-year appropriation period, Auditor General Samuel S. Lewis has figured \$12,000,000 as the revenue from the coal tax, or \$6,000,000 a year. The sum which will now be received has been included in his estimate which will guide the Legislature in making its appropriations during the coming winter.

The State Workmen's Insurance Board has authorized a dividend of 15 per cent in addition to the 10 per cent differential allowed in compensation insurance written with the state fund. The state fund has issued 8,500 new policies during the present year. The total reserve of the fund set aside to pay claims to injured workmen and to dependents of deceased employees of policyholders in the fund is \$3,140,661. This amount, the board announced, is exclusive of claim payments already made. During the past seven years the fund has accumulated a surplus amounting to \$2,362,609.

UTAH

D. D. Muir, Jr., general manager of the United States Smelting, Refining & Mining Co., has been made vice-president and general manager of the United States Fuel Co., a subsidiary of the first-named corporation. This promotion comes to Mr. Muir but a comparatively short time after he was named second vice-president of the United States Smelting, Refining & Mining Co.

The National Coal Co., headed by F. A. Sweet, C. N. Strevell, C. T. Worley, George A. Storrs and George S. Payne, all of Salt Lake City, has petitioned the Public Utilities Commission for authority to construct 13 miles of railroad to connect the coal properties in the Gordon Creek Canyon district with the Utah Railway two miles south of Helper. The company proposes to build 10.627 miles of main line beginning at station 753 on the Utah Railway and extending in a northwesterly direction. At Coal Creek, according to the plans submitted to the commission, one branch would extend 1.375 miles into the Coal Creek district, while the main line would continue for a few miles, where a branch 0.527 mile long would extend in a northwesterly direction to open up the Right Ford properties. Another branch would extend 0.546 mile into the Bryner Canyon district. Applications covering the necessary rights of way have already been filed with the U. S. Land Office. It is set forth that thousands of acres of new coal lands would be opened by the branch line. The proposed line is to be a coal road exclusively. If permission to construct the line is granted the work will be commenced at once, it is stated.



Anthracite Economy Service Traveling Show

To teach people how to cut down their coal bills the Anthracite operators are sending this unique traveling information bureau and exhibit throughout the country this winter.

VIRGINIA

The Island Creek Coal Co., of West Virginia, is preparing to open a branch office in Norfolk within a short time. No announcement has been made as to who will take charge.

The Fort Dearborn Coal Co., has changed its name to the Fort Dearborn Fuel Co., Inc., authorization having been given by the State Corporation Commission this week for the change. C. Henry Harman is president of the company and W. G. Brinson is in charge of the Norfolk branch.

WEST VIRGINIA

Permission has been granted to the Preston Smokeless Coal Co. to increase its capital stock from \$75,000 to \$100,000.

Plans have been matured by the Gauley Mountain Coal Co. to develop a tract of 4,000 acres of coal land on Maple Meadow Fork of Coal River, in Raleigh County, which in recent tests by diamond drill showed the existence of the Beckley seam of smokeless coal. The Hewitt and other New York interests own the Gauley Mountain Coal Co., of which R. H. Morriss, of Ansted, is the resident manager.

Five coal tracts in the Liberty district of Ohio County were purchased early in December by S. A. Williams from Lee Grossman and others for \$42,500. Coal and farm property on the Middle Wheeling Creek road at the same time was acquired by three Elm Grove men for \$36,000, the coal purchased being in the Pittsburgh vein.

The Coalfield Fuel Co. and the West Virginia Eagle Coal Co. announce the removal of their offices from the Virginian Land Bank Building, Charleston, to their mines at Boncar, Fayette County.

Deputy sheriffs and state police have arrested 16 men charged with conspiracy to blow up the tippie of the New England Fuel & Transportation Co. at Grant Town. Some of the men have been released under bond of \$1,000 for the next term of the grand jury. The arrests were made by Sheriff John D. Charlton of Marion County upon information received from passengers on a street car running between Fairmont and Fairview who say they heard 16 men discussing the alleged plot to dynamite the tippie.

Fire at the plant of the Donald Coal Co. at Stollings, early in December, destroyed seven miners' dwellings and made six families homeless. None of the plant buildings, however, was damaged by the fire.

Whatever may be the outcome of court proceedings in southern West Virginia believed to be indirectly related to the question of unionizing the mines in certain fields where there has been no organization, mine owners in the Kanawha field are still proceeding against union miners occupying company houses. A large number of deputy sheriffs have been engaged for the last week in evicting striking miners, 35 families having been ousted from the houses of the Bellemont Coal Co. at

Crown Hill and about 66 families from the houses of the Campbells Creek Coal Co. on Campbells Creek. Both companies declined to sign an agreement with the union and have made arrangements to operate non-union.

Fire early in December at the plant of the Guyan Mining Co. at Wilbur caused a loss of approximately \$150,000, partly covered by insurance. The headhouse, tippie, conveyor and much other outside plant equipment was totally destroyed, forcing a suspension of operations for the time being. It is believed that the plant will be rebuilt just as soon as possible though just what the plans of the company are has not been stated by the general office at Cincinnati.

The Island Creek Coal Co. has declared an extra \$1 a share on the common stock, besides the regular quarterly dividend of \$2, both payable Jan. 1 to stockholders of record Dec. 19. Three months ago a similar extra dividend was declared. The regular quarterly 1½ per cent on the preferred also was declared. It is payable on the same dates as the common dividends.

CANADA

T. W. Scott, chief engineer for the Canadian Collieries (Dunsmuir), Ltd., has been appointed assistant superintendent for the Cadomin Coal Co., Alberta. Fellow members of the Canadian Collieries staff tendered Mr. Scott a dinner and presented him with a Brunton pocket transit.

The Campbell Commission, appointed by the federal government under the Combines Investigation Act, which has been sitting at Winnipeg for some time to inquire into dealings of the Winnipeg Coal Dealers Association, will continue its sittings at Brandon, Manitoba; Saskatoon, Saskatchewan; and Calgary, Alberta.

The Rothwell Coal Co., Avon Coal Co., Harvey Welton and Welton & Henderson Co. have submitted a petition to Sir Henry W. Thornton, general manager of the Canadian National Railways, asking that a spur line of that system be built to the southern mining area at the Grand Lake coal fields. It was promised that consideration would be given this matter. There is a spur line in the southern area but it is from the Grand Lake Coal & Ry. line. Recently the Canadian National built a spur line extending from the transcontinental line across Canada from Moncton to Prince Rupert, connecting with the new northern area developed in the Grand Lake territory. W. B. Evans, manager of the Rothwell Coal Co., presented the petition.

Nearly one thousand miners of the Edmonton District Miners' Federation have joined the Central Council of the Canadian Labor Party following a mass meeting held recently at Beverly.

Reports from the Drumheller field, Alberta, indicate that production has reached a high level, no less than 322 cars passing over the Canadian National Ry. weigh scales in one day recently. The mines are striving to fill

their back orders, but cold weather has deluged them with more business, and the prospects are that it will be some time before they are back to normal. The total shipments for the week ending Nov. 22 were 1,862 cars, as compared with 1,688 cars in the previous week.

W. H. Sutherland, provincial Minister of Public Works, has announced that the government has set aside \$15,000 to be used for road work in the Fernie district, which is to be started at once, with a view to relieving distress among the miners thrown out of work by the closing of the Crow's Nest Pass Coal Co.'s Coal Creek collieries. Charles Stewart, Federal Minister of Labor, who had been asked by the provincial government to co-operate in finding work to relieve the distressed miners, has stated that his department cannot do anything.

According to figures just made public at Ottawa, there have been 145,000 tons of Nova Scotia and New Brunswick coal shipped into Central Canada under the system of bounties amounting to 50c. per ton, established by the Dominion Government on Sept. 2. Of this quantity 28,000 tons went to Ontario and 117,000 tons to Quebec.

New Companies

Wilputte Coke Oven Corporation, Louis Wilputte, president, Augusta, Me., chartered under Maine laws, has filed a certificate of statement and designation in the office of the Secretary of State at Albany, N. Y., to enable the corporation to do business in New York State. The corporation will manufacture coke and gas products and is capitalized at 1,000 shares of no par value. The New York office is 469 Fifth Avenue, New York City.

The Texas Coal & Mining Co. has been incorporated in Eagle Pass, Texas, with a capital stock of \$50,000, by C. W. Settle, R. E. Doty and T. J. Evers.

The Lincoln Coal Co., with a capital stock of \$50,000 has been organized in Erie by James Brennan, P. H. Powers, Thomas P. Morgan and T. Woodbury. It is understood the new company will take over and operate a mine, but the directors will not reveal their plans.

The Kansas State Charter Board recently granted a charter to the South End Coal & Mining Co., of Mineral, Kan. The incorporators were Dug Murphy, George Dixon, Tom Young, Bert Hardesty and Joe Frye, all of Mineral. The company is employing forty men in its mine south of Mineral, and expects to increase its payroll soon. The mine, which formerly was operated by the Smith Coal Co., was abandoned several years ago because of faults, but a year ago the men responsible for the new company cleaned up, and since breaking through the fault have been operating it profitably.

A charter was granted recently to the Englevalle Coal Co. of Frontenac, Kan., by the Kansas State Charter Board. The company, incorporated at \$100,000, has for its president J. S. Patton, and S. I. Patton is its secretary. The announced purpose of the company is to separate the Patton properties near Englevalle from the Patton Coal & Mining Co., which operates near Frontenac.

The Rodgers-Elkhorn Coal Co., capital \$50,000, was formed recently for development on 1,000 acres of coal property in the Shelby Creek section of the Pike County border, in eastern Kentucky. T. T., T. F. and G. E. Rodgers, all of Cincinnati, are the men behind the new organization.

A state charter has been issued at Harrisburg, Pa., to the Hickory Run Coal Co., Wilkes-Barre, with a capital stock of \$25,000. The purpose of the company is to mine and ship coal, and the incorporators are: Nat D. Stevens, Tunkhannock, Pa., treasurer; W. D. Phelps, Forty Fort, Pa., and H. M. Reber, Wilkes-Barre, Pa.

Traffic

Raise in Coke Rates Denied

It was reported from Washington on Dec. 8 that the Interstate Commerce Commission had refused to approve the proposal of several railroads to increase freight rates on coke from \$2.59 to \$2.90 a ton in car lots from Kentucky, Virginia and Tennessee producing points to Cincinnati, Covington, Newport and vicinity adjacent to Cincinnati.

Association Activities

The Montreal Coal Association, Inc., has been organized by the wholesale and retail coal dealers of Montreal with the object of putting a stop to malpractices in the trade, more especially the giving of short weight. The association has obtained a provincial charter of incorporation. The following officers were elected: President, R. J. Buck, president of the George Hall Co., of Canada; vice-president, Emile Cool; secretary, Charles Petrie; directors, L. Z. Cohen, L. E. Barrett; L. T. Vipard, D. L. Campbell, H. Aird, J. O. Labrecque, J. O. Charlevoix, C. E. F. Dumaresq and G. P. Morgan. The association has a membership of about 100, including nearly all the wholesalers and a large percentage of the retailers.

R. C. Tway, of the R. C. Tway Coal Co., Louisville, operating mines in Harlan County, was re-elected president for the sixth consecutive term of the Harlan Coal Operators' Association, at the annual meeting at Harlan, Ky., Nov. 19. B. W. Whitefield, Sr., of Harlan, was named vice-president, and E. R. Clayton, Harlan, re-elected secretary. The report of the association showed forty-three members, representing an investment of \$25,000,000, and last year these members produced 3,878,008 tons of coal. The Louisville & Nashville R.R. furnished a special train for a trip of inspection over the Harlan district in the afternoon for members and their families. The annual dinner was held in the evening, at which time Harry L. Gandy, Washington, executive secretary of the National Coal Association, was the principal speaker.

Publications Received

Annual Report of Coal Mines, State of Alabama, 1923, including 1922 statistics. Pp. 160; 6x9 in.; tables.

Natural Gas in Alberta, by R. T. Elworthy, Mines Branch, Department of Mines, Ottawa, Canada. Advance section report on Mines Branch investigations of mineral resources and the mining industry during 1923. Pp. 35; 6x9 in.; tables.

Permissible Explosive, Mining Equipment and Apparatus Approved Prior to Jan. 1, 1924, by J. E. Crawshaw, L. C. Hsley, D. J. Parker and A. C. Fieldner, Bureau of Mines, Washington, D. C. Technical paper 364. Pp. 30; 6x9 in.; tables.

Seasonal Operation in the Construction Industries: The Facts and Remedies, McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 213, 6x9 in. Price, \$2.50. Reports and recommendations of a committee of the President's conference on unemployment, with a foreword by Herbert Hoover.

Engineering in American Industry—The Development of Industry in these United States during One Hundred and Twenty Years, by Conrad N. Lauer, McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 96; 9x12 in.; illustrated. Price, \$2.50. The book presents in interesting style, by means of text, old pictures, graphic charts, historical and statistical data, the story of the growth of industry and engineering.

Labor Relations in the Fairmont (W. Va.) Bituminous Coal Field, by Boris Emmet, Bureau of Labor Statistics, Washington, D. C. No. 361. Pp. 86; 6 x 9 in.; tables.

A. S. T. M. Tentative Standards, 1924. American Society for Testing Materials, Philadelphia, Pa. Pp. 763; 6 x 9 in.; illustrated. Price, \$7 in paper and \$8 in cloth binding. Tentative standards for the following are given: Coal and coke, timber, preservative coatings, insulating materials, petroleum products and lubricants.

The Organization and Functions of the Institute of Research of Lehigh University, Bethlehem, Pa. Circular No. 1. Pp. 19; 6 x 9 in. Describes the organization and functions of the institute.

Eye Hazards in Industrial Occupations, by Louis Resnick and Lewis H. Carris. The National Committee for the Prevention of Blindness, Inc., New York City. Pp. 247; 6 x 9 in.; illustrated. Price, paper bound, \$1.50; fabrikoid, \$2.50. A handbook for safety engineers, safety inspectors, etc.

Annual Report of the State Inspector of Coal Mines of Arkansas. Pp. 48; 6 x 9 in.; tables.

Annual Report of the Board of Regents of the Smithsonian Institution, Washington, D. C. Publication 2724. Pp. 554; 6 x 9 in.; illustrated. Includes operations and condition of the institution for year ending June 30, 1922.

Employee Representation Plan; Policy-holders Service Bureau, Metropolitan Life Insurance Co., Madison Ave., New York City. Report No. 67. Pp. 26; 8x11 in. Summary and brief analysis of employee representation plans recently developed in American industry.

Industrial Notes

The Nordberg Manufacturing Co., of Milwaukee, Wis., which has for many years constructed hoists, oil engines and compressors, expects to enter in the business of manufacturing underground shoveling machines, a special department having been opened for that purpose.

The Conveyors Corporation of America, Chicago, Ill., announce the appointment of C. S. Price, First National Bank Bldg., Hazleton, Pa., as its district representative for northeastern Pennsylvania. Associated with Mr. Price in the sale of the American steam jet ash conveyor is E. E. Elliott, who has had wide experience in steam jet ash disposal engineering.

Obituary

T. S. Neel, aged 60, a prominent coal man of Johnstown, Pa., died suddenly at the home of his brother in Huntington, W. Va., early in December, while on a business trip. He is survived by his wife and two children of Johnstown, Pa., and two brothers, James Neel, of Highco, W. Va., and W. S. Neel, of Huntington. Both of Mr. Neel's brothers are engaged in the coal business.

Thomas F. Kelly, of Coalport, one of the leading operators in the Clearfield district of central Pennsylvania, died at the Jefferson Hospital, in Philadelphia, Dec. 7, aged 51 years. He was head of the Irvona Coal & Coke Co. He is survived by his wife and nine children. Burial was made at Snow Shoe on Dec. 10.

Coming Meetings

American Engineering Council. Annual meeting Jan. 16-17, 1925, Washington, D. C. American Engineering Council, 29 West 39th St., New York City.

Northeast Kentucky Coal Association. Annual meeting Jan. 22, 1925, Ventura Hotel, Ashland, Ky. Secretary, C. J. Neekamp, 816 Ashland National Bank Bldg., Ashland, Ky.

American Institute of Electrical Engineers. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

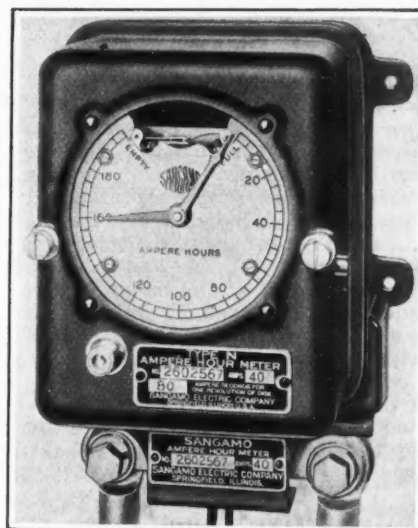
American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

New Equipment

Amperehour Meter Takes Bumps and Jolts

The Sangamo meter, recently placed on the market, is designed for installations where the well-known Sangamo locomotive type meter has previously been specified—on electric automobiles, trucks, mine locomotives, industrial tractors, etc., where severe conditions of operation are likely to be encountered.

Installed on the vehicle, truck or locomotive, the meter indicates, by means of a black hand, the amount of battery discharge that has taken place. By



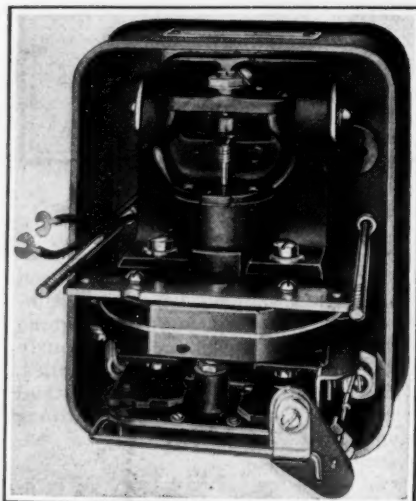
Amperehour Meter with Non-Spilling Mercury Element

Moisture is effectively excluded so that the formation of mercury dross is retarded.

comparing the position of this hand with a red hand located at the point where the battery should be recharged, the operator can always tell what remaining capacity is available before the battery should be put on charge. This guards the vehicle from being stalled in service.

When the vehicle is placed on charge the amperehour meter automatically gives the battery the required overcharge and opens the charging circuit at the proper time, thus eliminating the need for attendance.

The meter operates on the mercury motor principle and is extremely simple in construction. One set of permanent magnets furnishes both the driving and damping flux and eliminates the need of a separate damping disk. The only exposed moving parts are a short section of the spindle and a small counterweight. The possibility of bearing troubles is precluded through the mercury flotation of the moving element, which relieves the lower bearing of all pressure and produces a slight upward pressure of only one tenth of an ounce on the upper bearing. Because of the cushioning effect of the mercury, the bearing pivots are prac-



An Over-Charge of Battery Is Easily Obtained

Adjustments can be made to the meter to provide automatic over-charge of the battery.

tically immune from the effects of heavy shocks and vibration.

The armature box is of molded insulation, specially treated to retard the formation of dross. A non-spilling mercury chamber effectively precludes all possibility of the mercury leaking out, regardless of how the meter is handled.

The adjustment of the meter is very simple, being obtained by means of a single clamp slider which can be securely fastened in position, thus assuring permanent calibration.

A variable resistor element with calibrated scale is provided to give the battery automatically the required over-charge.

Inductive Time-Limit Motor Starter

To meet the requirements for uniform periods of acceleration of motors, the Cutler-Hammer Manufacturing Co.,

Milwaukee, Wis., has developed the controller shown in the accompanying illustration.

Dashpots and other mechanical and electro-mechanical means of timing the acceleration are not employed, the inductive principle being utilized instead. A transformer is used instead of relays, interlocks, dashpots or other moving parts to control the rate of acceleration. The construction of the controller is simple, and there are no moving parts other than the reversing switches, main magnetic switches and the accelerating switches.

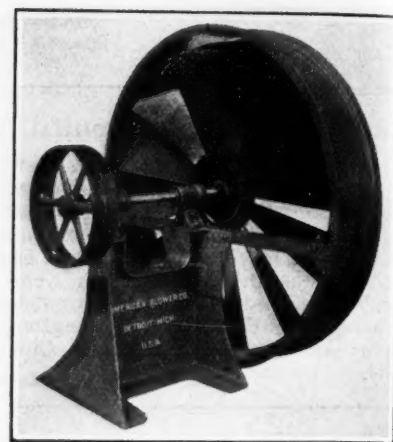
By means of a transformer a holding-out current of transient nature is obtained in successive accelerating switches. Transfer of connections takes place automatically with the cutting out of successive steps of resistance without disconnection of the coil circuits. Adjustments for the timing of the acceleration period of the motor are made on the stationary parts. The acceleration is said to be uniform under ordinary conditions of load variations, the time being somewhat increased on heavy loads.

Particular attention has been given to the ease of replacement of wearing parts, permanency of adjustment, reliability of operation, elimination of ruptured coil circuits and burnouts. Arcing tips are provided and the arc shields of the blowout provide a deep channel in which the arc is disrupted. The main contacts are of the butt type.

Inexpensive Mine Fan

A new mine fan, designed to handle a maximum volume of air economically, both from the standpoint of original cost and operating expense, has been developed by the American Blower Co., of Detroit, Mich. It is ruggedly constructed in order to withstand general mine usage, and to permit its removal from one location to another without injury.

The assembled fan consists of a disk type wheel surrounded by a steel casing



Easily Portable Fan

This type fan may be used economically in general mine service. It is ruggedly constructed of steel and cast-iron.

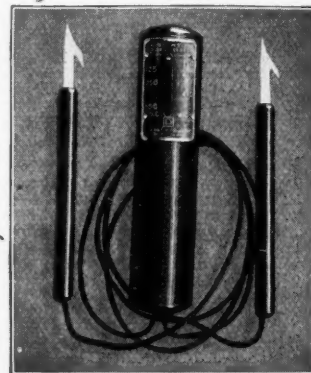
which is fastened to a cast-iron base. This cast-iron base forms the supporting member for two double ball bearings, which in turn carry the shaft on which the wheel is mounted.

So that the wheel may deliver large volumes of air against a resistance, it is provided with twelve overlapping blades securely attached to a large central disk, so as to prevent back flow through the central portion of the fan. These blades are further re-enforced by an annular ring around the periphery of the wheel. The performance is further increased by the use of a steel casing around the wheel to prevent radial discharge of the air. The outfit is arranged conveniently for belting to a motor, or for direct connection, as required.

Lampless Voltage Tester

A voltage tester which does not require the use of lamps to indicate the voltage has been developed by the Square D Co., of Detroit, Mich. This device differentiates between alternating and direct current, and measures voltages up to 550 volts.

Inclosed in a rugged fiber housing, and of pocket size, the instrument has a broad range of uses, being suitable for locating open circuits, blown fuses and other causes for the irregular op-



Voltage Tester of Wide Applicability

This device shows the approximate value of either direct- or alternating-current voltages up to 550 volts.

eration of motors. As a voltage tester it is thoroughly accurate, and therefore may be used to roughly check circuits.

Time-Limit Starter

Each accelerating contactor is controlled through a transformer which induces a holding-out current of transient value. No contractor can close until the current values are satisfactory for the shunting of the starting resistance.

